RAILROAD GAZETTE

FRIDAY, OCT. 4.

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Contributions.

Lessons from the Palatine Bridge Accident.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The recent collision at Palatine Bridge, with the recollection of the more disastrous accident on the same road at Spuyten Duyvil, January 13, 1882, prompts again the question, Why does not a crowded road like the New York Central adopt the precaution against such accidents which has been taken by about all the roads of the world of anything like its amount of business? Is it not criminal for a management to insist upon working without the block system, relying upon that absurd, hypothetical interval of ten minutes, which the least delay to the leading train may reduce to nothing, as in the present and numerous other cases, some fatal and some not? In the present case the great reliance of this system—the rear brakeman—appears to have done his duty with most commendable activity, judging by the testimony of President Ledyard, who is certainly a competent witness.

Mr. Toucey says it was the fault of the engineer, who did not stop his train instantly when his cylinder head blew out. Very good; but are the lives of the passengers to be left at the mercy of the judgment of an engineer running an express train at night, with a cylinder head out, and in entire uncertainty as to what is to happen next to his machine and train? Is this poor fellow responsible for the lives of the killed and mangled passengers because in his confusion he allows the train to run on, forgetting the monster that is pursuing him from behind? Or is it rather the management which sets up its judgment (how much better is it than the engineer's?) against that of the great majority of the managers of similar traffic the world over?

The great argument of this school of railroad men is: The block system relaxes the discipline of the trainmen and makes them less vigilant in guarding against rear collisions. How much this argument amounts to can be seen from study of a parallel phenomenon with which every railroad man is familiar. After a fine bridge, built with all the resources and experience of modern science, is finished and tested with twice the load to be carried over it in practice, how does the engineer of the first "regular" that crosses pass the bridge? Is it, though without any instructions to slow down, at full speed, or does he shut off on approaching and put on brakes, and finally glide over it as gently as if he were rolling over a crockery bridge? I will venture to say that in nine cases out of ten it is after the latter fashion. Now let us try another case. A washout has taken place. In the deep gap has been placed a rickety trestle made of every odd and end of timber that could be found on the road. I recall one where the roof timbers of a recently demolished church were called into requisition. How do the engineers behave when they have to cross this structure? Well, the first time they act very much as with the first-class bridge, but if the exigencies of the road compel the continuance of this structure long enough to allow a runner to go over it a dozen times; if it doesn't creak and sway much, I think railroad superintendents will bear me out that not the most rigid slow order in the world will hold the average runner down to within 10 miles of the prescribed speed if he is at all pressed for time, and many of them will go banging over the shaky structure as if it were the solidist part of the road. "Familiarity breeds contempt." It always has and always will. Eternal vigilance as to discipline and the use of every precaution known are the price of safety in railroading, and *not* the remission of one precaution in order to make another more effective, when that other is the watchfulness of man.

A friend calls my attention to the "Meadows accident on the Pennsylvania as an instance of how the block system fails sometimes. No doubt it does, or has, as every appliance dependent upon human oversight will do; but if in that case there had not been a conjunction of the most outrageous infractions of discipline—not a simple lack of judgment on the part of a confused engineer—the accident never could have occurred. Moreover, the advance of science has now, by interlocking the signal at the beginning of a block with the "line clear" button at the end of the same, made it impossible for the signalman at the beginning of the block to let a train in without collusion on the part of the man at the other end.

There is one other argument against the block system—its delays to ordinary traffic. No doubt it is disagreeable to the average citizen to be prevented from coming as close as may be to being killed without being so. Somebody has said that if a cannon were devised which would fire a load of passengers from New York to Chicago in 10 minutes and land four loads out of five successfully, the fact of the fifth load being pretty regularly smashed would not deter the bulk of the traffic from going that way, if the price were not too high. Something is due, however, to that portion of the traveling world which values its life, from one consideration or another, and prefers a little more delay accompanied by a greater degree of safety.

It is to be hoped, therefore, that the railroad commissions of the different states will be instructed to supervise railroad safety appliances to such an extent that they will be expected from time to time to call upon roads of crowded traffic to introduce the block system. Experience has shown such mild authority to be quite sufficient. No railroad company would dare to risk the possibility of accident under a system which they had been admonished publicly to amend.

W. HOWARD WHITE.

Brake Shoes and Tire Wear.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Under this heading you published in your last week's issue a tabulated statement which provokes inquiry. I have nothing to say against the Ross shoe or any other shoe that does good work upon tires, but I am, with many others, anxious to gain definite and reliable information as to the best form and material that should enter into the construction of brake shoes. It appears that with the application of the Ross steel shoe upon the tires of the Philadelphia, Wilmington & Baltimore engines the gain in mileage between turning up the tires is quite startling. Five hundred per cent. gain is such an immense figure that there is little wonder—providing there is no error in the statement—that the Committee on Driver Brakes gave the Ross shoe an endorsement; but it would be interesting to know exactly how the results given were arrived at.

Taking the statement of the Philadelphia, Wilmington & Baltimore as published, the basis of comparison is the wrought-iron brake shoe with which it appears the engines were equipped before the Ross shoes were applied. Wrought iron as a material for brake shoes has been condemned over and over again and no worse material could possibly have been taken as a basis of comparison, and it is surprising that it should still be used especially upon engines, as it has the faculty of seizing and letting go in a series of jerks. Cast iron has been and is far more extensively used as a material for brake shoes generally, and good results have been obtained from a moderately hard cast iron, the mileage between turnings having reached 105,450 miles, with the tires still in good condition, and this was done with plain cast iron shoes without flange, and on an engine brake that did all the braking for its train, no other brakes being used. From this it would appear if cast iron had been made the basis of comparison the results might have been different. Then, again, it would have assisted largely in the formation of a clear opinion if sections of the tire had been given showing the exact wear and shape of the tire in each case before turning up.

Then with regard to the statement itself. How is it that two engines, so nearly alike as No. 216 and No. 88, produce such widely different results? Both engines have the same sized cylinder and both have practically the same weight upon the drivers. Both are fitted with the Ross steel shoe, yet one of them makes 15,412 miles per $\frac{1}{32}$ of an inch tire wear, and the other only 2,261 miles per $\frac{1}{32}$ of an inch wear, and this latter mileage is actually less by 50 per cent. than was obtained by the wrought-iron shoes on engine 77 in the same tabulated statement, seeing that 4,527 miles, per $\frac{1}{32}$ of an inch wear, are given as obtained from this engine with the plain wrought-iron shoes. This seems to be out of harmony with the general statement, and is, at least in its present shape, a paradox that shows the necessity of a suspension of judgment until further details are given.

The whole question of the best material, shape and size of brake shoes is an open one and might be very profitably followed up. The lack of definite and reliable information was felt by the Committee on Driver Brakes, as expressed in their report, and until such information is forthcoming it will be hard to make the ordinary student of the subject believe that brake shoes can do effective work and extend both the life of the tire and the shoe at the same time.

JAS. HOWARD.

Notes from the Pencoyd Bridge Works.

One of the best evidences of the improved condition of the iron and steel business is the activity of the rolling mill and structural metal plants. One of the busiest now is the Pencoyd. Nearly every tool is going, and, in spite of the increasing demand for steel in preference to iron, the whole of the old iron plant at these mills is actively engaged in filling orders. The demand for both steel and iron has increased so much that what was a few years since, when iron was almost universally used, a large iron mill, is now only sufficient to supply that fraction of the total orders which call for iron for structural shapes.

Last May these works put into operation an open-hearth steel plant which embodies all the modern improvements in that method of steel manufacture. The new hammer shop, with a 20-ton hammer built in Germany, stands adjacent to the open-hearth plant. This hammer is made principally of wrought iron, after the German custom, and is a ponderous machine. The stanchions are cylinders of iron plates riveted with butt joints and joined at the top by a header, also of wrought iron, which carries the uprights, forming the guides and cylinder supports. On two sides of the hammer, so arranged as to reach the two adjacent furnaces, are two quick-working, hydraulic, 20-ton, post cranes mounted upon one large bed plate bolted to the heavy foundation. These cranes are not in any way attached to the building; an essential feature where they are intended to be used in conjunction with a hammer, otherwise the building is subjected to racking strains.

The ground occupied by the Pencoyd works is a narrow strip between the Philadelphia & Reading Railroad and the Schuykill River, and its shape compels all extension of buildings to be made longitudinally. While for some classes of work this shape of property would not be an advantageous one, yet for the general purposes of rolling mill and bridge work there seems to be no objection, particularly when one side of the grounds is bounded by a railroad and the other by a stream whose banks can be utilized for a dumping ground. It is because of this shape of the property that the new steel eye-bar plant, the foundations of which are already well under way, is to be made long and narrow. The building will be 100 ft. wide and of such design as to be extended, when desired, parallel with the Philadelphia & Reading.

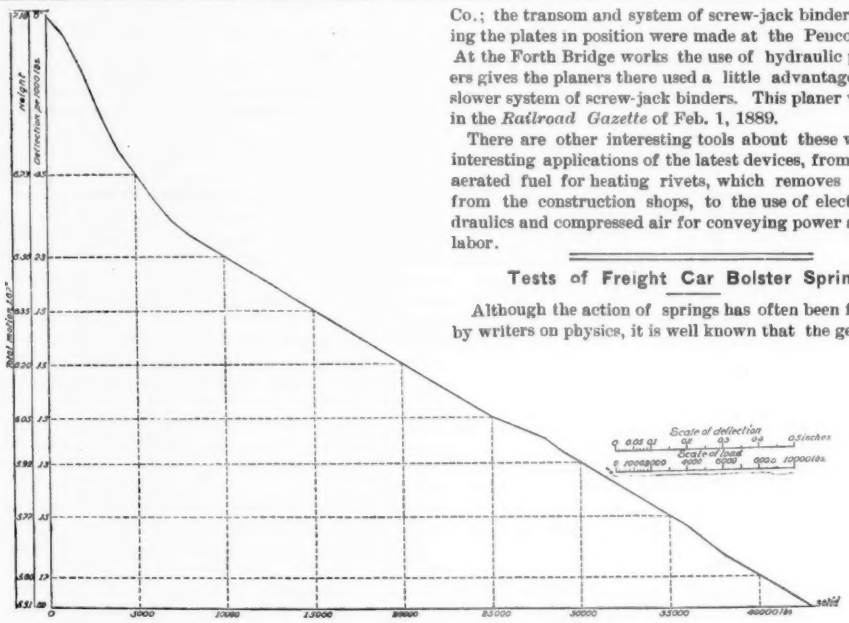
The changes made in general bridge construction in this country within recent years can be read in the shops of these works. The more general use of the plate girder has changed the character of many of the tools. These works have given especial attention to these modifications, and perhaps no bridge shop in the United States is better fitted for rapid, accurate work in larger quantities then is the Pencoyd to day. A comparison with foreign bridge works would be still more advantageous to the Pencoyd works. Even at the Forth Bridge works, the machinery for which has been much written about, there is by no means the facility for quick, accurate work that is to be found here. And yet the engineers who visited that bridge this summer will nearly, if not all, agree that the methods there used for forwarding the work seemed more American than those at most works visited.

In particular, one may call attention to the difference in drilling machinery. That at the Forth Bridge seemed, while well constructed and of multiple type, rather temporary and slow working. In comparison, at the Pencoyd shops may be seen one of the best appliances for drilling beams and plate girders yet constructed. It is a special tool driven by electricity and designed at the works. It carries eight drills on radial arms—these were made by Bement, Miles & Co., of Philadelphia—all mounted on a long cross head of wrought-iron plate girders which slides up and down on wrought-iron uprights held together at the top by a large box girder, upon which is placed the Thomson-Houston electric motor that furnishes the power for driving the drills and for moving the whole structure along the rails upon which it travels. The machine is, in fact, a huge double traveling drill press. It has drills on both sides of the cross head in such position as to give the greatest freedom of motion to the operator, and can be propelled by power from one end of the shop to the other on the rails provided for it. The electric current is collected by long collectors rubbing on conductors laid on wooden insulators on the roof girders. The collectors are made long in order that one end may not leave the conductor before the other has crossed over the gap in the conductors, necessitated by the tracks for the trolleys which carry girders and like work crosswise of the shop. The value of electric transmission of power can hardly be more forcibly shown than by this apparatus. With any other transmission known the complication would be almost too great to permit the machine to have so many of its functions performed by power.

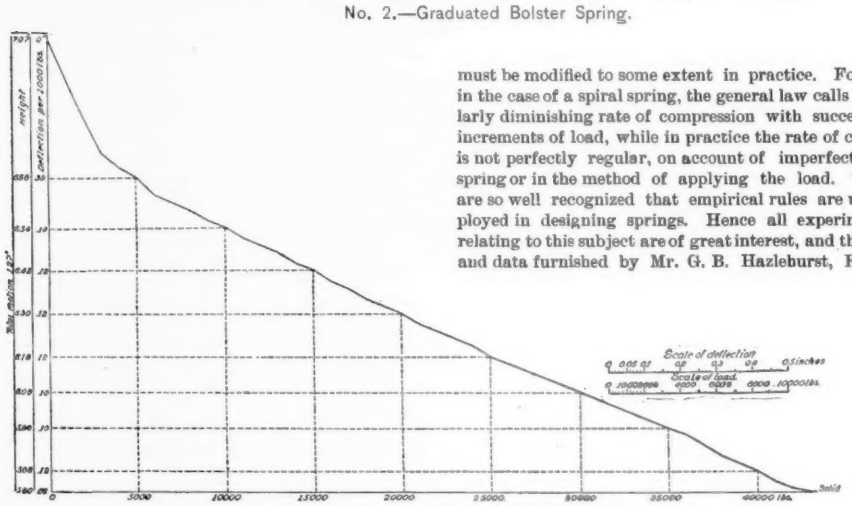
Another useful and superior tool, not seen in the Forth Bridge shops, is an air-driven power riveter on the Allen system, mounted on a large hydraulic plunger in such a way that it, as a whole, can be lowered or raised as desired. This riveter has 6 ft. range below the dies, and can do the largest class of plate girder work. The advantage of this arrangement is that, when a vertical row of rivets is to be driven, as in the case of stiffeners on plate girders, it is only necessary to raise the riveter, the girder remaining undisturbed. It also obviates much of the difficulty incident to setting large work into position. With it, when a girder is brought along by a traveling crane, the adjustment of the dies to the rivet to be driven is accomplished quickly and without a signal to the crane driver.

In the yard, at the end of the main construction shops, is being placed a large traveling crane driven by an independent steam engine and boiler mounted on the crane itself. This crane has been necessitated by the increase in the dimensions of plate girders, some of which now weigh as much as 35 tons each. Until recently such weights of single parts were not frequently to be handled at the shops. This crane will lift such girders up above the embankment and lower them on to the cars on the railroad siding.

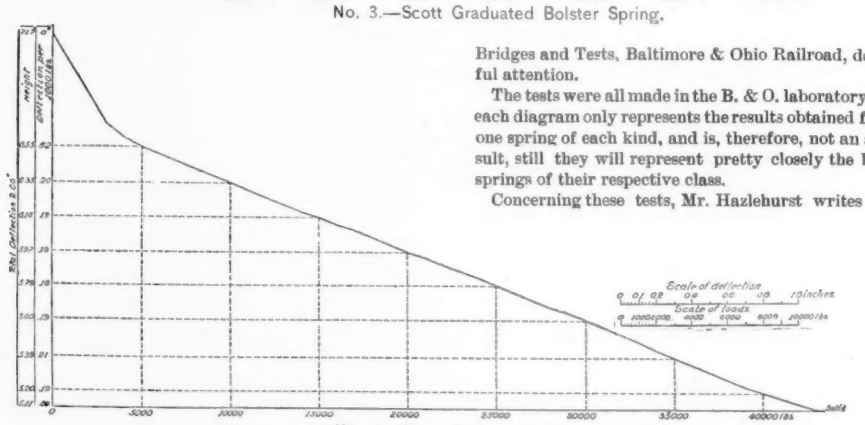
The largest plate planer in the United States is here, located in a building by itself. Without a shift it planes plates 30 ft. long and 8 ft. wide, the ends being faced at any reasonable angle or width up to 8 ft., at one setting. The base, cutting tools and end planer were made by Bement, Miles &



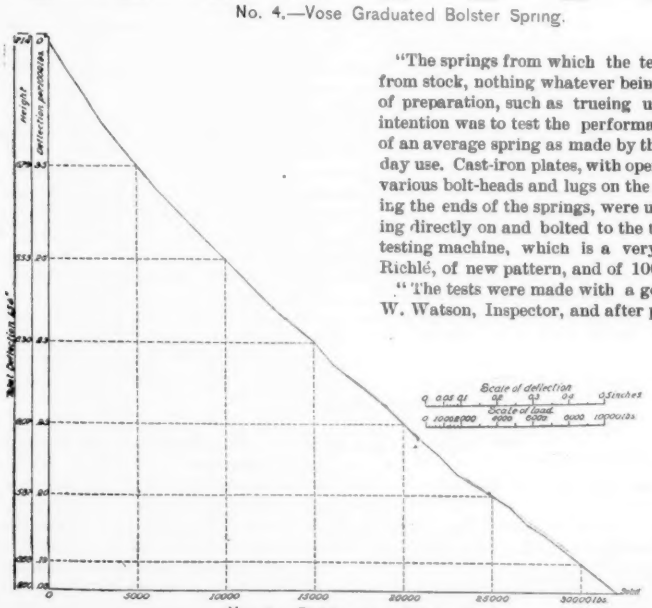
No. 2.—Graduated Bolster Spring.



No. 3.—Scott Graduated Bolster Spring.



No. 4.—Vose Graduated Bolster Spring.



No. 5.—Refrigerator Bolster Spring.

TESTS OF FREIGHT-CAR BOLSTER SPRINGS,

Made under the direction of G. B. HAZLEHURST, *Engineer Bridges and Tests, Baltimore & Ohio Railroad.*

Co.; the transom and system of screw-jack binders for holding the plates in position were made at the Pencoyd works. At the Forth Bridge works the use of hydraulic plate holders gives the planers there used a little advantage over the slower system of screw-jack binders. This planer was shown in the *Railroad Gazette* of Feb. 1, 1889.

There are other interesting tools about these works, and interesting applications of the latest devices, from the use of aerated fuel for heating rivets, which removes all smoke from the construction shops, to the use of electricity, hydraulics and compressed air for conveying power and saving labor.

Tests of Freight Car Bolster Springs.

Although the action of springs has often been formulated by writers on physics, it is well known that the general laws must be modified to some extent in practice. For example, in the case of a spiral spring, the general law calls for a regularly diminishing rate of compression with successive equal increments of load, while in practice the rate of compression is not perfectly regular, on account of imperfections in the spring or in the method of applying the load. These facts are so well recognized that empirical rules are usually employed in designing springs. Hence all experimental data relating to this subject are of great interest, and the diagrams and data furnished by Mr. G. B. Hazlehurst, Engineer of Bridges and Tests, Baltimore & Ohio Railroad, deserve careful attention.

The tests were all made in the B. & O. laboratory, and while each diagram only represents the results obtained from testing one spring of each kind, and is, therefore, not an average result, still they will represent pretty closely the behavior of springs of their respective class.

Concerning these tests, Mr. Hazlehurst writes as follows:

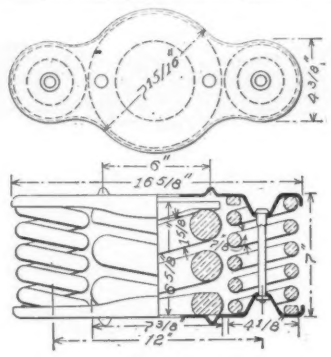
"The springs from which the tests were made were taken from stock, nothing whatever being done to them in the way of preparation, such as trueing up bearing surfaces, as the intention was to test the performance and obtain the results of an average spring as made by the manufacturer for everyday use. Cast-iron plates, with openings corresponding to the various bolt-heads and lugs on the malleable iron caps covering the ends of the springs, were used top and bottom, bearing directly on and bolted to the table and cross-head of the testing machine, which is a very excellent one, made by Richlé, of new pattern, and of 100,000 lbs. capacity.

"The tests were made with a good deal of care by Mr. J. W. Watson, Inspector, and after plotting the diagrams, and the irregularities in the deflection line having been noted, the springs were re-tested with a view to discovering errors; in every case the peculiarities first noted were fully confirmed by the re-test, proving the general accuracy of the work. The variations in the deflection line having thus been traced to the springs themselves, I offer the following explanation for their occurrence, which, I think, accounts for the same.

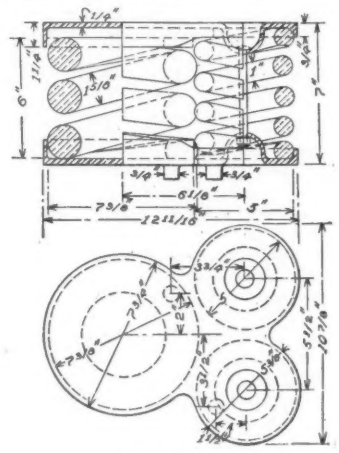
"Within the elastic limit of the material and with a spring perfectly coiled, and with ends absolutely true—in other words, with a mechanically perfect spring, or nest of springs—the line of deflection should be straight; therefore any variation from this straight line would become a measure of the defects in workmanship and material existing in the spring. These defects would result from:

1. Imperfect bearings.
2. Imperfect coiling.
3. Tight coiling (when in nests).
4. Want of homogeneousness in material.

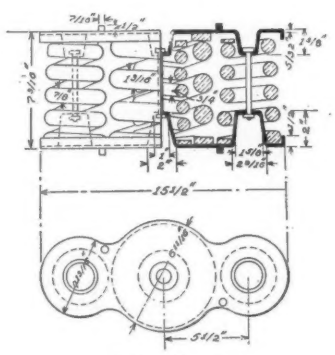
"These, however, are not all the causes that produce distortion in the deflection line, for the design of spring has much to do with it; and, because a spring gives a more or less curved line of deflection, it is not necessarily to be condemned until its imperfections have been directly traced to defects. This is very clearly shown and accounts for most



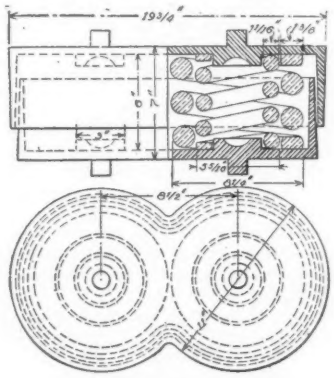
Spring No. 2.



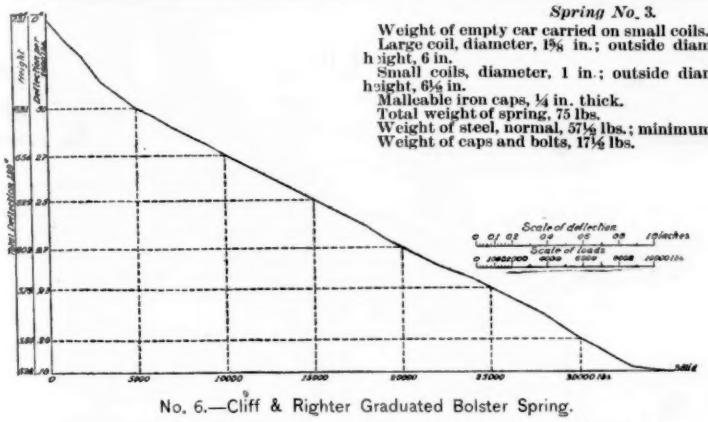
Spring No. 3.



Spring No. 4.



Spring No. 5.



No. 6.—Cliff & Righter Graduated Bolster Spring.

of the irregularities at the left-hand top of diagrams Nos. 2, 3, 4, 6 and 7, for if the sketches of the springs on these diagrams are examined it will be seen that one part of the spring takes weight before the other, and it is not until a point is reached at which both springs are sustaining the load that the deflection line becomes straight.

"At the bottom right-hand ends of the diagrams the irregularities are generally due to imperfect coiling, for as the springs become solid, any imperfections in the coiling will cause some parts to come in contact before others, causing a break in the straight deflection line.

"Again where a spring is composed of several coils packed inside each other, if the clearance is not sufficient for each spring to work separately, there will be more or less binding which will produce irregularities.

"Defects from want of homogeneousness of material or in tempering are not likely to be so easily shown. Such a spring usually fails to meet the requirements of the specifications when inspected and is thrown out. As I have diagramed no springs with this known defect I am unable to state what peculiarities they would exhibit."

The following are the specifications:

Spring No. 2.

Weight of empty car carried on outside springs.
Centre coil, 7⅜ in. outside diameter, 6⅜ in. free height, 1⅝ in. diameter.
End coils, 4⅛ in. outside diameter, 6⅞ in. free height, ⅞ in. diameter.
Solid steel plates, ⅛ in. thick, 16⅜ in. long, 7 15-16 in. wide at centre.
Height of spring over plates, 7 in. free, 6 5-16 in. with 14,000 lbs., 5 5-16 in. solid.
Capacity, 33,000 lbs., with ⅛ to ¼ in. motion left.
Normal weight of steel in coils, 49½ lbs.
Minimum weight of steel in coils, 49½ lbs.
Weight of steel plates, 7½ lbs.

Spring No. 3.

Weight of empty car carried on small coils.
Large coil, diameter, 1⅝ in.; outside diameter 7⅜ in.; free height, 6 in.
Small coils, diameter, 1 in.; outside diameter, 5 in.; free height, 6⅛ in.
Malleable iron caps, ¼ in. thick.
Total weight of spring, 75 lbs.
Weight of steel, normal, 57½ lbs.; minimum, 56 lbs.
Weight of caps and bolts, 17½ lbs.

Spring No. 4.

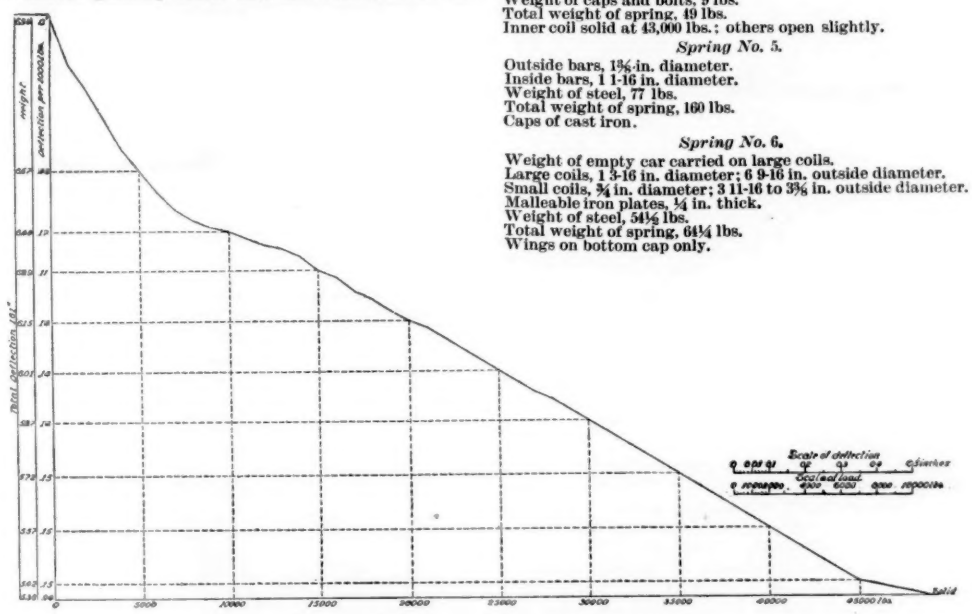
Weight of empty car carried on large coil.
Large coil, diameter, 13-16 in.; outside diameter, 6 7-16 in.; free height, 6⅞ in.
Inner coil, diameter, ¾ in.; outside diameter, 3⅛ in. to 3½ in.; free height, 6 3-16 in.
End coils, diameter, ⅞ in.; outside diameter, 3⅜ in. to 4 in.; free height, 6⅛ in.
Height of spring over plates, 7 3-16 in., free.
Malleable iron caps.
Weight of steel, 40 lbs.
Weight of caps and bolts, 9 lbs.
Total weight of spring, 49 lbs.
Inner coil solid at 43,000 lbs.; others open slightly.

Spring No. 5.

Outside bars, 1⅝ in. diameter.
Inside bars, 1 1-16 in. diameter.
Weight of steel, 77 lbs.
Total weight of spring, 160 lbs.
Caps of cast iron.

Spring No. 6.

Weight of empty car carried on large coils.
Large coils, 1 3-16 in. diameter; 6 9-16 in. outside diameter.
Small coils, ¾ in. diameter; 3 11-16 to 3⅜ in. outside diameter.
Malleable iron plates, ¼ in. thick.
Weight of steel, 54½ lbs.
Total weight of spring, 64¼ lbs.
Wings on bottom cap only.



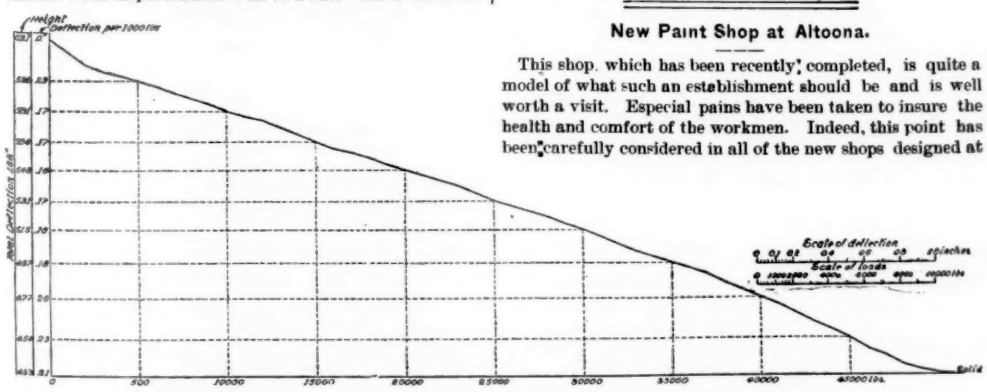
No. 7.—Pickering Graduated Bolster Spring.

Spring No. 7.

Weight of empty car carried on highest pair of coils.
Two coils, 7 in. high, free; 1 1-16 in. diameter; 5 3-16 in. outside diameter.
Two coils, 6 16-32 in. high, free; 1 5-32 in. diameter; 5 5-16 in. outside diameter.
Malleable iron caps, ¼ in. thick.
Weight of steel, 58 lbs.
Total weight of spring, 72½ lbs.

Spring No. 8.

Four coils: 1 in. diameter; 5 in. outside diameter.
Steel plates, ⅛ in. thick.
Weight of steel, 43 lbs.
Total weight of spring, 49 lbs.



No. 8.—Bolster Spring.

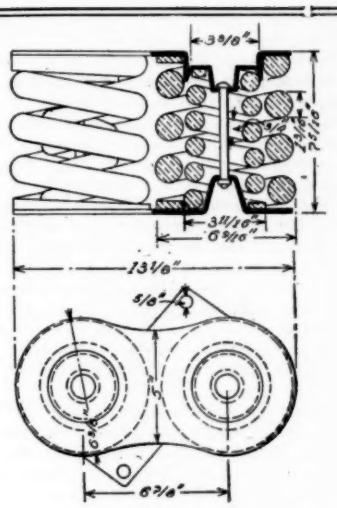
TESTS OF BOLSTER SPRINGS—BALTIMORE & OHIO RAILROAD.

New Paint Shop at Altoona.

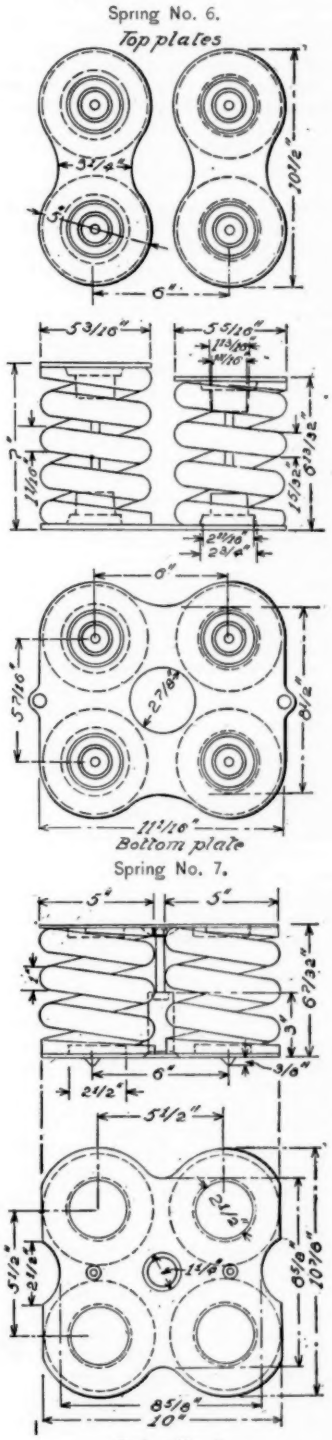
This shop, which has been recently completed, is quite a model of what such an establishment should be and is well worth a visit. Especial pains have been taken to insure the health and comfort of the workmen. Indeed, this point has been carefully considered in all of the new shops designed at Altoona. The lavatory arrangements are of the most modern design, and yet not expensive. Probably they cost no more than much inferior arrangements in common use. The lavatories are provided with white wash basins and neat closets, and are finished in pine in the natural color. Their location is such that any uncleanliness or defect in plumbing, causing odors, will be at once detected.

The plan of the building permits extension in any direction. The roof is a modification of the saw-tooth plan, designed by Mr. Ely with special reference to the climatic conditions. It consists of separate teeth, supported by open bays, in which the snow can lodge and be easily shoveled off The upper glazed surface is inclined at about 45 degrees. The bottom of the intermediate bay is slightly inclined to carry water to the centre of the building, whence it is drained away by pipes which go down alongside the posts carrying the roof. The light is well diffused, preventing heavy shadows and also doing away with much of the glare of varnished work under concentrated light. Artificial light is supplied by incandescent lamps, and in many instances the lamps are arranged so that they can be taken into the interiors of the cars, the globes being protected by wire netting and the lamps provided with tin reflectors.

The heating and ventilation are provided for together. Warmed air is supplied by two large fans driven by steam power from an adjoining building. The air passes through



Spring No. 6.



Spring No. 7.

Spring No. 8.

galvanized iron pipes, of dimensions graduated to the supply required at each place, and enters the building by pipes about 6 ft. from the floor. The cold air is taken out through gratings in the floor and passes into a main conduit, which returns the air to the fans or allows it to escape to the atmosphere, as is desired. At night, when it is important to hasten the drying of the work in progress, the air from the shop is passed through the fans and heaters repeatedly, becoming very dry, and the circulation is considerably quickened. Coolers are provided which collect any condensation.

The floor is of concrete of nearly uniform color throughout. Instead of horses and planks for the workmen to stand on when cleaning, painting or varnishing the cars, there are provided brackets, attached to the line of posts which support the roof, and adjustable vertically. On these brackets are carried the planks which form the benches for the workmen to stand or sit upon.

In the engine room, with the fans, are placed the dynamos for electric lighting, making altogether a very neat, compact and noiseless plant for the heating, lighting and ventilation. The link leather belt is used here with much success.

In front of these shops is the electric transfer table, which was illustrated and described at much length in the *Railroad Gazette* of March 22, 1889. This is a very successful apparatus. It moves smoothly and noiselessly on rails laid on a roadbed of gravel selected for its uniform size and color. In the yard surrounding the transfer table and the shops is to be seen no useless lumber or rubbish of any sort, and altogether the establishment is a pleasant one to see.

European Rail Fastenings.

Mr. Hohenegger, Superintendent of Construction of the Northwestern railroads of Austria, has contributed to the International Railroad Congress a report on the subject of rail fastenings and allied matters on European railroads. The article is presented in the shape of answers to the following series of fourteen questions which were sent to the members of the Congress:

1. What kinds of fastenings do you employ on your main lines? Give drawings of the different fastenings used.
2. What kinds of wood do you use for cross ties?
3. What proportion of wooden ties do you find it necessary to renew annually?
4. What is the influence of iron rail chairs on
   a the durability of wooden ties?
   b the preservation of the gauge?
5. What proportion of chairs must be annually renewed because of breakage?
   a Forged chairs (iron).
   b Mild steel chairs.
6. What kind of spikes do you use?
7. Are the wooden ties bored before driving the spikes?
8. What proportion of spikes must be annually renewed through breakage or wear?
9. What kind of screwed spike do you use?
10. What proportion of screwed spike must be annually renewed through breakage or wear?
11. Which do you prefer, spikes or screwed spikes, and what position do you give them relatively to the rail?
12. What is your experience on the resistance of either form of fastening to drawing due to the lateral pressure of the rolling stock on the rails?
13. What proportion do you recommend between the width of flange and the height of Vignoles rails?
14. Besides spikes and screwed spikes, do you use any other and stronger fastenings for Vignoles rails and wooden ties? What are they and what results have they given?

Answers to these questions were received from 61 railroads. We give a brief summary of the answers:

Question 1.—The spike most extensively used is of the ordinary form, with square section. Some of the roads of Northeastern Europe use a spike a little over 9 in. long, the spikes of ordinary length not having sufficient holding power, against the action of frost. A spike with octagonal point was at one time used on the Paris, Lyons & Mediterranean Railroad. This form requires boring of the ties before driving, and is still in use on some European roads. Screwed spikes are used on 20 roads.

Question 2.—In the northeastern countries the native coniferous woods are found to answer perfectly under the light traffic. In the southern countries preference is given to oak. The beech and larch are still used to some extent. On lines with light traffic impregnated pine ties have been found to last longer than oak ties not impregnated.

Question 3.—The renewals amount to about 25 per cent. per year for soft woods not impregnated, and from 2 to 8 per cent. when impregnated; oak ties, impregnated, from 0.25 to 7 per cent.; not impregnated, 15 per cent.

Question 4.—Only seven roads, with light traffic, dispense with rail chairs. All others are strongly in their favor, as a means of increasing very much the stability.

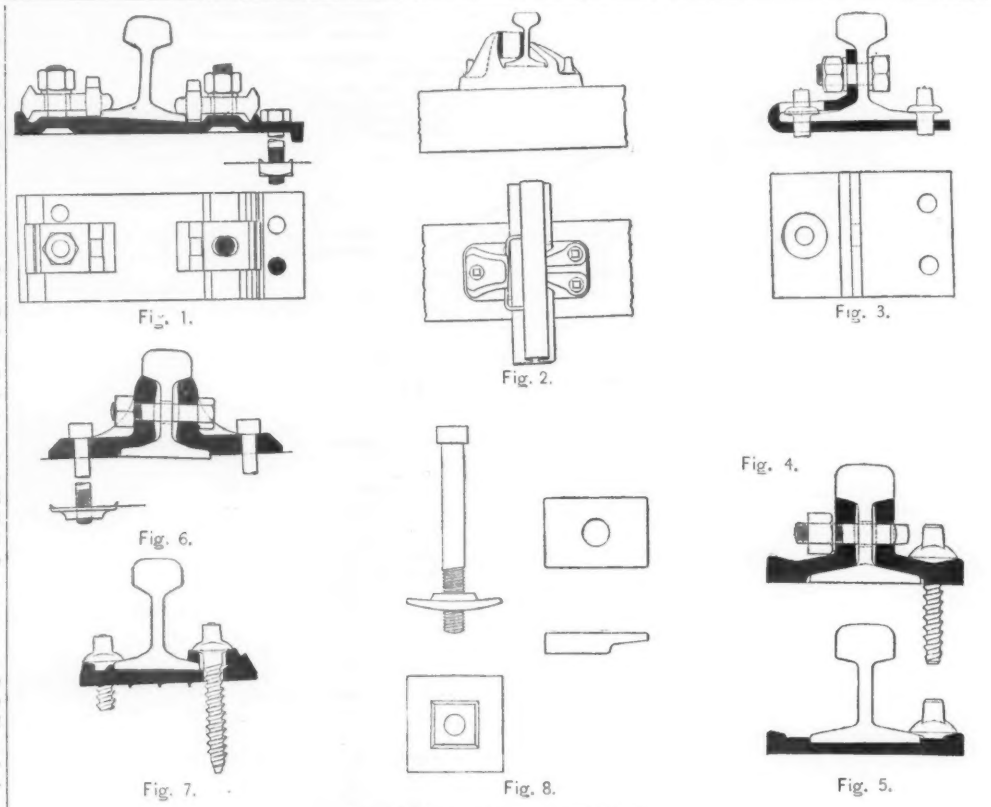
Question 5.—Twenty-one roads place the breaking of forged iron chairs at 8.1 per cent. For steel chairs no figures are given.

Question 6.—This has been practically covered by the answers to Question 1. Two roads, the Paris-Lyons & Mediterranean and the Chemin de fer de l'Est, France, use screwed spikes only.

Question 7.—To this question 18 roads answer no, without qualification, and 26 reply in the affirmative. Seven roads bore only the hard wood ties. No special observations appear to have been made.

Question 8.—Forty-one railroads place the percentage of renewal at 11. Of late mild steel has been successfully used for spikes.

Question 9.—The average length of the screwed spike varies from about 3 to 5½ in.; the diameter from 0.75 to 0.92 in.; the pitch of the thread ranges from 0.3 to 0.4 in. Fig. 7 represents the bolt used on the Netherland State railroads. Its length is 6 in.; diameter, 0.92 in., and pitch, 0.4 in. This form of bolt also is used on the Belgian state railroad. It will be noticed that the under surface of the head of the bolt rests, on one side, on a part of the rail flange, and, on the other side, on a raised portion of the chair, so that danger of bending the upper part of the bolt is avoided.



EUROPEAN RAIL FASTENINGS.

Question 10.—The figures given vary between 0.48 and 4 per cent. per annum.

Question 11.—Ten railroads prefer screwed spikes to spikes, without reserve, while six others prefer them only under certain conditions. Opinion varies considerably. In a general way, however, screwed spikes, it would seem, are not to be recommended in cold climates, owing to the disturbing action of frost. Spikes prevent creeping of the rails in a greater degree. Placed on the outer sides of the rails spikes serve as well as screwed spikes in every way, and, at the same time, cost less. On the inner sides of the rails, however, the screwed spikes offer the greater resistance.

Question 12.—From a number of responses it appears that, where used under conditions exactly alike, screwed spikes have been found to offer greater resistance to pulling out than spikes.

Question 13.—The mean proportion of flange width to height of rail is 85 per cent. For very heavy traffic 90 per cent. is recommended, and, in some cases, even 100 per cent.

Question 14.—The replies to this question embrace a number of illustrations showing the arrangements adopted on several roads where the ordinary fastenings have proved inadequate. Of these we reproduce several. Fig. 1, for example, shows end and top views of the rail chair and accessories in use on the Northwestern Railroad of Austria on curves having radii of less than 1,650 ft. These chairs were first introduced on this road in 1885, and at the close of 1888 34,615 of them had been put down. The results obtained with them have been eminently satisfactory, the gauge having been so well preserved that no readjustment has been found necessary up to the present time.

The French Western Railroad uses screwed spikes, a usual form of fastening being shown in fig. 2.

The Paris-Lyons & Mediterranean Railroad uses, besides the ordinary form of chair and screwed spike, the arrangement shown in fig. 3. The illustration explains itself.

The Belgian state railroad, while using screwed spikes and spikes for fastening, is about to experiment with the device represented in fig. 4. On sections having a heavy grade, and where high speeds are maintained, it is proposed to use the form of fastening shown in fig. 5, fitted to two adjoining ties near the middle of each rail. This has not yet been put into practice. For curves of short radius, as at stations, the Chemin de fer Rhénan-Neerlandais employs cast-iron angle plates held in place by bolts as shown in fig. 6.

Fig. 7, already referred to, shows the chair, etc., in use on the Netherland State railroad. Fig. 8 finally shows the bolts and fixtures used by the Great Western Railroad of England. Detailed explanations of these several engravings are hardly necessary. They tell their own story. Mr. Hohenegger concludes by directing attention to the desirability of further and numerous experiments with still stronger forms of fastenings.

Master Car-Builders' Association Standards.

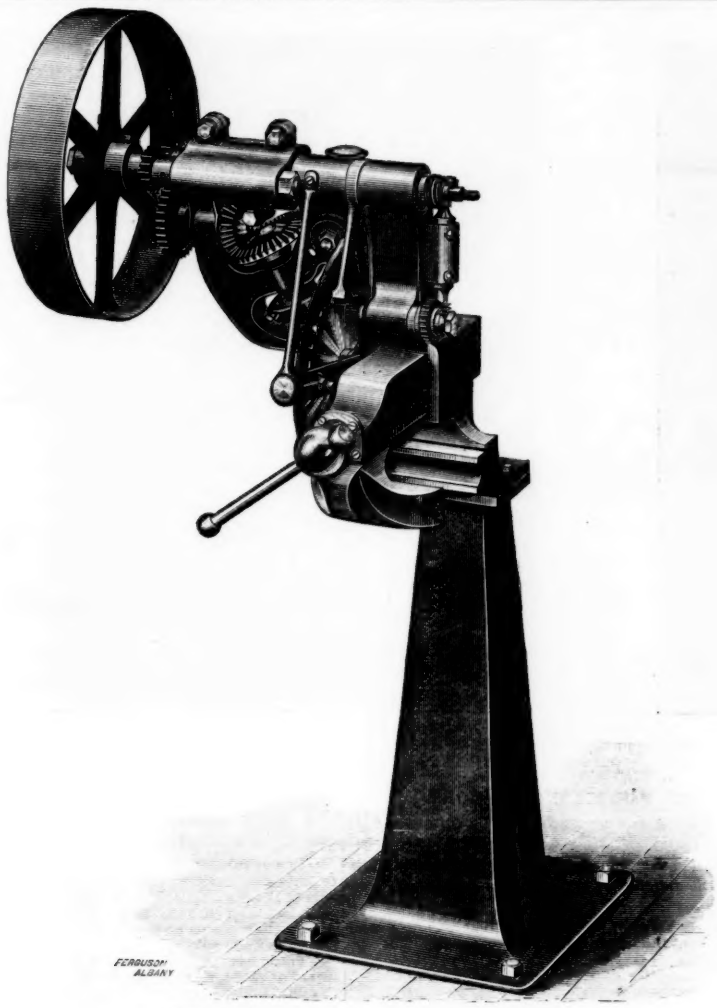
The secretary of the Master Car Builders' Association, Mr. John W. Cloud, has sent out under date of Sept. 28 a circular announcing the results of the letter ballot on the standards proposed by the last convention. We give the results below. It will be seen that all of the recommendations of the Committee are adopted but one quite minor one.

	Affirmative.	Negative.	Total.	No. Votes necessary for Adoption.	Results of votes.
Journal Box Lid.					
Fletcher journal box lid	370	107	477	318	Adopted
Of dimensions submitted, viz., 4⅝ in. centre of opening to centre of pin hole	266	211	477	318	Rejected
Cast Iron Wheels.					
Specification as printed in *Railroad Gazette*, July 5, 1889	362	83	445	297	Adopted
Guarantee as printed in *Railroad Gazette*, July 5, 1889	312	128	440	294	"
Axle for Cars of 60,000 lbs. Capacity.					
Diameter of journal 4¼ in	440	33	473	316	Adopted
" " wheel seat 5⅝ in	440	33	473	316	"
" " centre 4⅝ in.	439	34	473	316	"
" " collar 5¼ in	440	33	473	316	"
" " dust guard 5¼ in	440	33	473	316	"
Length of journal 8 in	473	0	473	316	"
" " wheel seat 7¼ in	403	70	473	316	"
" " dust guard 2 in	438	35	473	316	"
" " collar ⅝ in	468	5	473	316	"
" centre to centre of journals 6 ft. 3 in	438	35	473	316	"
Length over all 7 ft. ¼ in	433	44	477	318	"
As per drawing submitted	371	86	447	298	"
Brake Gear for Air-Brake Cars.					
Maximum train pipe pressure 70 lbs.	434	30	464	310	Adopted
Brake power for freight cars 70 per cent. of their light weight	434	30	464	310	"
General arrangement of brake gear, as shown in *Railroad Gazette*, July 5, 1889	435	29	464	310	"
Details, as shown in *Railroad Gazette*, July 5, 1889	429	35	464	310	"
Position of train pipe cock and dummy coupling, as shown in *Railroad Gazette*, July 5, 1889	435	29	464	310	"
Brake beam deflection 1/16 in. per 7,500 lbs. freight, and 1/16 per 15,000 lbs. passenger	363	97	460	307	"
Brake shoes as by present standard	413	51	464	310	"
M. C. B. Draw Bars and Carrier Irons.					
Draw bar 30 in. long for all new work	443	25	468	312	Adopted
Draw bar 28 in. long for repairs	338	137	475	317	"
Size at neck, 5 in. sq.	408	67	475	317	"
Tail end as per drawing submitted	347	128	475	317	"
Carrier irons, 5½ in. horizontally by 5¾ in. vertically	407	51	458	306	"

The Higley Metal-Sawing Machine.

This machine is made in several sizes and adapted to various uses. The illustration shows the "C" machine, which is the size calculated for general machine-shop use and will cut up to 5½ in. round.

The secret of the satisfactory working of the saw is in the method of propelling it. The saw has holes near the periphery arranged like gear teeth, so that it can be driven by a



THE HIGLEY METAL SAWING MACHINE.

suitably arranged train of gearing, leading from the pulley shaft. The saw revolves from the work upward, and as the power is applied near the periphery close to the strain of the cut instead of at the centre, a light steel saw soft enough to be filed can be used without buckling. The saw runs in guides, which keep it perfectly steady, and it is run at the speed of the regular milling cutter, about 45 per minute.

The frame which carries the saw is made to swing, so that when the cut is through the feed is released by the friction nut on the front side and the saw can be swung back by hand and held in place until the work has been taken out and the new work put in, when the saw is lowered to the work and the feed engaged with the friction nut. The feed is operated from the worm on the main shaft, which drives the vertical shaft, and then through frictional gearing to the quadrant on the saw frame, so that the feed is started, stopped and varied by the adjustment of the friction nut. In cutting hard metal the feed is adjusted to allow it to slip when the saw strikes a hard spot, to save the saw; and in cutting soft metal the friction is set up tight to give a heavy feed.

The vise used on this machine is a strong, steel screw vise.

The saw works satisfactorily when cutting 1 sq. in. cross section per minute, and will average from 50 to 100 cuts before requiring any filing.

This "C" machine is made for hand and power and is useful in any machine shop for cutting round, square or irregular shapes of iron and steel, instead of doing it in a lathe, cutting-off machine, or in the blacksmith shop. In boiler shops it can be used to good advantage for cutting off boiler tubes, as the cut is made without leaving any burr: also in architectural iron works, for sawing beams, channel, tee and angle irons. This is also made a portable hand machine by putting a crank on each end of the driving shaft instead of the pulley and leaving off the base, so that it makes a light, handy machine for outside jobs of architectural iron work.

A railroad machine is made which is a light, portable machine for cutting off rails, capable of cutting off a 60-lb. rail in 13 minutes. These are in use on the Pennsylvania, New York Central, Delaware & Hudson and other roads.

A table machine is now building for the Elmira Bridge Co. that will saw 36 in. in length at each setting.

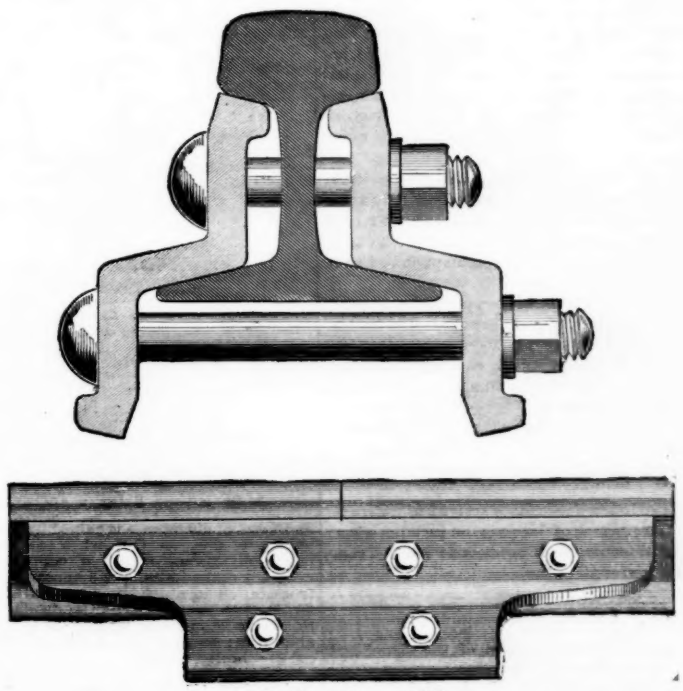
J. J. McCabe, No. 121 Liberty street, New York, is the sole agent, and the machines can be seen in operation at his place.

Cloud's Rail-Joint.

The joint which we illustrate here was designed by Mr. John W. Cloud, and is known as the "double angle girder truss joint." It was designed to give the joint-splice the full strength of the rail without impairing its elasticity. The increase in strength, owing to the deep web between the ties, is of course very considerable. Tests recently made by Messrs. Hunt & Clapp, of Pittsburgh, with a 33½-lb. joint of this form showed that to produce a permanent deflection of ⅛ in. required 53.9 per cent. greater load than did the six-bolt, 54-lb. joint of the standard section now used on one of the trunk lines. Besides the gain in vertical strength, it is held that the bolts which pass through the webs below the rails correct any defects in the adjustment of the splices, and force the upper edge of this splice to a full and perfect bearing under the rail head. It is found that after the four bolts through the web of the rail have been tightened, tightening the bolts in the lower webs of the splices always results in showing that further tightening of the upper bolts is necessary—that is to say, the angle-plates are brought to a more perfect bearing and fit by strains brought upon these lower bolts than was secured before those bolts were introduced. It is said, also, that the motion and consequent wear of the bearing surfaces of the rails and angle-splices are much reduced in this form of joint.

The reciprocal strains of the two sets of bolts serve as a lock, and, it is claimed, will do away with the necessity for nut-locks. It is thought that, although with short plates the rails are held very securely, still the resistance offered to the longitudinal movement of the rails due to expansion and contraction will not be sufficient to cause any distortion of them.

The webs which come down between the ties bear against against them, and thus prevent creeping of the rails, and slotting of the flanges of the splice plates is unnecessary. The number of parts is no greater than that of the modern six-bolt joint. Therefore, the labor in laying is no more. The bars from which the splices are cut are rolled symmetrically, and the splice-bars are cut out in such a way that there is no waste of metal, and the greatest practicable economy of manufacture is secured. The result is that this joint, being much lighter than a long splice joint of equal strength, can be sold as cheaply as any good joint in the market. It is controlled and handled by the Dunham Manufacturing Co.



CLOUD'S RAIL JOINT.

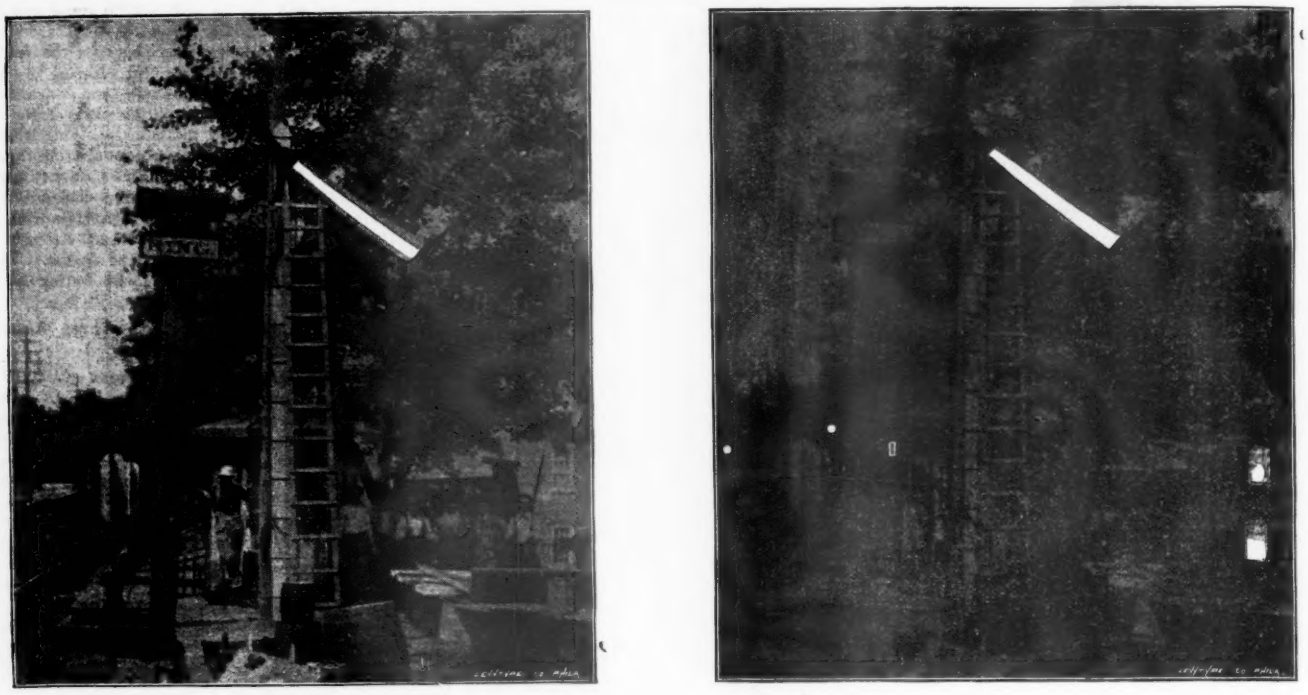
Made by the DUNHAM MANUFACTURING CO., *Boston and Chicago.*

The Special Train for the Three Americas Conference.

The Secretary of State has arranged with the Pennsylvania Railroad to furnish a special train for an excursion to be given the delegates to the International Conference, to be held in November at Washington, which will be quite unique in many of its characteristics. This conference, which is a commercial affair, is attended by representatives of the Argentine Republic, Brazil, Chili, Colombia, Costa Rica, Ecuador, Guatemala, Hayti, Honduras, Mexico, Nicaragua, Paraguay, Peru, Salvador, Uruguay and Venezuela, and these gentlemen, as guests of the United States, are to be taken to the various cities and towns that they may have a good idea of the resources of the country.

The train will consist of five Pullman vestibule sleeping cars, a dining car and a car containing a baggage room, barber shop and smoking room, the composition of the train being in general similar to that of the New York and Chicago limited. It will be lighted by electricity from a dynamo in the baggage car, and it is stated that electric light will be used in the headlight of the locomotive and in the tail lamps. The crew numbers 28 men, including five cooks, five waiters and a conductor for the dining car. The Pennsylvania's crew will run the train throughout its trip, being assisted on foreign roads by pilots, and relays of men are provided to enable the train to be run both night and day.

The itinerary laid out covers a period of 42 days and a trip of 5,406 miles. The train is already on its journey, having started from Washington, D. C., at 8:15 a. m. Oct. 3, and is due to arrive at that city on its return, Nov. 13. The places to be visited are: West Point, Oct. 3; thence by government vessel to New York Oct. 4, and thence by steamer "Puritan" to Fall River, where the train will take up the party Oct. 5; Boston, Oct. 5, and Sunday, Oct. 6; Lawrence and Lowell, Oct. 7; Manchester, N. H., Oct. 8, and thence to Portland, Me. Worcester, Mass., will be reached Oct. 9, and from there the party will go to Willimantic, South Manchester and Hartford, Conn. Oct. 10 Collinsville, Meriden and New Haven will be visited, and on the next day Springfield and Holyoke, Mass. The party will stop at Albany that evening, and will reach Niagara Falls Oct. 12. Buffalo is visited the 14th, and Erie, Cleveland and Newburg, O., on the 15th. The whole of Oct. 16 will be given to Cleveland, and the 17th to Detroit and Ann Arbor, Mich. Friday, 18th, Grand Rapids, and Saturday, 19th, South Bend, Ind. The next three days will be spent in Chicago, and Milwaukee will be reached by the 23d. Thence the train goes to La Crosse and St. Paul, and that place and Minneapolis will take up the 24th and 25th. Saturday, Oct. 26, will be spent at Sioux City and Omaha, and on Monday Des Moines will be visited. Oct. 29 and 30 will be spent at St. Louis, and the 31st at Springfield, Ill.; Nov. 1, Indianapolis, and Nov. 2, Louisville; Nov. 3, Mammoth Cave;



Safety.—Day. *Safety.—Night.*

Fig. 3.

THE KOYL PARABOLIC SEMAPHORE.

Monday, 4th, Lexington, and Tuesday, 5th, Cincinnati; Nov. 6, Mansfield, O., and thence to Pittsburgh, where the 7th and 8th will be spent. Nov. 9 a stop will be made at Altoona, and Philadelphia will entertain the visitors Nov. 10, 11 and 12. On Wednesday, 13th, the train returns to Washington, via Harrisburg.

The International Railroad Congress.

The third session of the International Railroad Congress was held at Paris Sept. 14 to 23. The first was held at Brussells in 1885 and the second at Milan in 1887. The results of these two sessions, in papers which were then presented and discussions which took place and in inquiries which have been prosecuted since, have been published in the *Bulletin* of the Congress, from which we have drawn from time to time more or less information. The Paris meeting of the Congress was the largest, and probably the most important, that has ever been held. Representative railroad men were present from about 25 different countries, including some of the most distinguished names in the profession. This year the session was divided into five sections, which sat simultaneously nearly every day. On one day a special visit was made to the Exposition, which was followed by a performance at the Grand Opera, offered by the French representatives, who also gave a banquet to the members of the Congress the last evening of the meeting. Over 60 papers were presented.

The first section dealt with permanent way and structures, and was divided into seven different sub-sections, which considered the quality and method of manufacture of rails and joints; the method of securing rails to the ties; methods of laying track on iron bridges; of working switches at long distances; traversers for rolling stock from one line to another, and the ventilation of long tunnels. This section has also outlined investigations which will be summed up in reports to be presented at the next session. These investigations will cover bridges, the fracture of rails, and the maintenance of way.

The second section considered traction and rolling stock, including compound locomotives and applications of electricity to railroad working and lighting, and it outlined for the coming session inquiries into tires, boiler tubes, the service of rolling stock, and data relating to the consumption of fuel in locomotives and lubrication.

The third section dealt with the subject of station management and the organization of freight service. The investigations outlined for the future by this section are into the utilization of stations, including length of sidings, arrangements of freight stations, machinery and appliances for loading and unloading freight, etc.

The fourth section considered subjects referring chiefly to questions of general railroad policy, including bonuses to employés, benevolent and prudential associations, international relations, etc.

The fifth section considered secondary systems of railroads, dealing with the best means of traction on such lines, particularly with special motors, such as electric motors, compressed air, soda or gas engines, etc.

The Koyl Parabolic Semaphore.

Nearly a year ago we showed the form of this signal and described it, and very recently we have given further information about it, and no doubt our readers have a very definite idea of its general theory. Two weeks ago, however, we spoke of the corrugation of the reflecting surface designed to diverge the rays. The inventor worked out the form of corrugation very carefully, as he has related in a recent issue of the *Journal of the Franklin Institute*. Concerning that, he says:

"In evolving the form of the reflector great accuracy was found necessary in the means for diverging the light, in

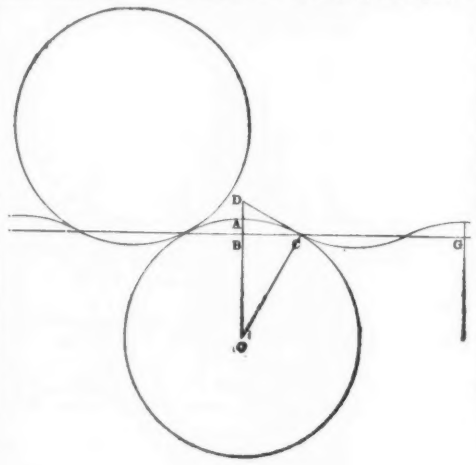


Fig. 1.

order to prevent waste, and the glass is made in accordance with the following theory: To diverge the light 16 degrees from the direction of the axis requires the surface of the glass to make an angle of 8 degrees with the parabola, and this is attained at blending intervals, for both directions from the

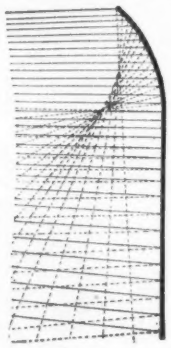


Fig. 2.

axis, and for any intermediate degree of divergence by a wave surface, in which, if the wave length be three-eighths inch, the amplitude must be—

$$\tfrac{3}{8} \text{ in.} \times \frac{vers.}{4\ sin.}\ 8 \text{ deg.} = \text{approximately } .006 \text{ in.};$$

and vertical divergence is gained by a wave surface at right angles to this, so that when one is superposed upon the other, divergence in all directions is the result. The accuracy of the formula will appear from the following demonstration in which the wave surface is represented (see fig. 1), with the circles from segments of which it is made and in which bg = wave length; $bc = \frac{1}{4}$ wave length; ab = amplitude; the angle $dcb = 8°$; and the triangles dcb and cob are similar, so that

$$ab = 1 - cos.\ 8° \text{ (or } vers.\ 8°), \text{ and } ab = bc \left(\frac{vers.\ 8°}{sin.\ 8°}\right) =$$

$$\frac{bg}{4} \times \frac{vers}{sin.}\ 8° = .006 + \text{in.}$$

"It was further found desirable to have the illumination of the signal uniform from its outer limit of visibility to the foot of the pole, and for this purpose the upper edge of the glass has been curved, as shown in fig. 2, and the band of light is now visible on the track in immediate proximity to the foot of the pole.

"There has never been any question of the value of the signal at night, since, if enginemen are instructed to run by the *position* of the blade, color being used to distinguish 'home' from 'distant' signals, the trains are relieved from accidents which might follow the breaking of a red or a green glass in the ordinary signal, or the engineman's mistaking a light; but the appearance of the parabolic semaphore by *day* is not only striking but most important.

"It has long been an eyesore to theorists and sticklers for consistency that, though red is used as the danger signal at night, a train must in the daytime regard that same red as a safety signal if only the board is at 45 degrees instead of being horizontal; or, in other words, they argue that as long as color signals are in use, the safety signal by day should be not only at 45 degrees, but *white*, and for the first time in the history of signaling, a semaphore which is red when horizontal is brilliantly white when dropped, the effect being due, of course, to the reflection of the skylight which passes through the vicinity of the focus to the blade, and further adding to the utility of the signal in that it becomes very conspicuous, and the necessity for a sky background is obviated."

The illustrations (fig. 3) show as nearly as may be the appearance of the signal in its safety position, by day and by night, and it is seen that, in both cases, the signal is at 45 degrees and white.

The World's Fair.

The deliberations in New York about the arrangements for the proposed exhibition of 1892 still continue, but no definite conclusions have been reached. The resolution, published on page 629 of the *Railroad Gazette*, to use a portion of the Central Park for the site of the fair, has probably roused more indignation than was anticipated by the authors of the decision, and there are signs that they would like to withdraw gracefully if possible. *Harper's Weekly*, which is edited by the Secretary of the Executive Committee on Site and Buildings, published a sketch of the site in its issue of Sept. 28, and marked the territory adjoining the Park: "Proposed Addition to Central Park." The editor, being asked by what authority the Fair Committee recommended additions to Central Park, declined to answer the question; and an editorial in *Harper's Weekly* of Oct. 5 recognizes that the opposition is so strong as to be well-nigh overpowering. The Sub-Committee on Buildings met Oct. 1 and passed resolutions changing the site materially. They recommended "the adoption of a site comprising Riverside and Morningside parks, with adjacent lands, including, approximately, the district bounded by 110th street, Fifth avenue, 113th street and Morningside Park; the district bounded by 108th street, Eighth avenue, Morningside Park, 116th street and Riverside Park; the districts on each side of the Bloomingdale Asylum grounds from 116th street to 122d street, * * * Sufficient area being thus obtained for the proper accommodation of the buildings, this committee recommends that no portion of Central Park be used for buildings for Exposition purposes. It expresses the belief, however, that it will be found desirable, and in the true interest of the public, to include in the Fair inclosure the adjacent portion of Central Park to afford amplitude to the grounds and the means of obtaining refreshment and repose without surrendering the right of admission." The resolutions further declare that the committee "has grave doubts as to the feasibility of securing in this way (by loan or lease) the whole of the needed area, in which event the committee sees but one means of relief, viz., legislation, whereby such land as cannot be obtained as above indicated may be taken by condemnation proceedings by and in be-

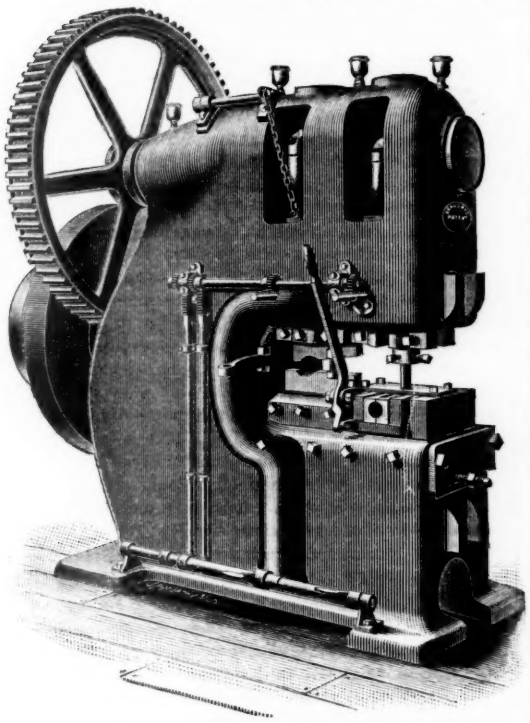
half of the city." The resolutions conclude by expressing the urgent necessity for immediate action, and desiring that a meeting of the full committee should be called at once. An invitation was also issued to property owners in the district outlined above, requesting them to communicate at once with the committee, stating on what terms their land could be obtained.

The tardy recognition of the difficulties surrounding the proposed site has earned for the committee the soubriquet of the "Committee on Hind-Sight," and a legal critic, who gives decisions of the Court of Appeals, showing that land cannot be condemned in this summary fashion by the Legislature, remarks that "The fundamental error of the committee was that it made the selection on the same principle on which children arbitrarily divide among themselves the contents of shop windows, having no thought of the rights of the owners."

The Executive Committee on Finance held a meeting on Tuesday of this week, and announced that they had requested the full committee to meet on Oct. 8, at which time a plan for raising funds may possibly be made public. On Sept. 24 Mr. Henry R. Towne suggested that the sum of $1,600,000 should be raised by 200 subscriptions of $5,000 each, and a few days later the editor of the *World* offered to be one of 25 subscribers, at $100,000 each, to a fund of $2,500,000. Nothing practical has resulted from these suggestions, and it is doubtful whether anything of importance will be accomplished until a practical site has been selected. There seems to be little hope of such a result, and the Fair project is practically killed, in the opinion of many. The extraordinary procrastination of the committee has, perhaps, chilled enthusiasm as much as anything. The committees were appointed by the Mayor Aug. 11; the committee on Finance met Aug. 20; the Committee on Site and Buildings, Aug. 22, and nothing has been yet decided.

Duplex Forging Press, Punch and Shears.

The tool here illustrated, made by Beaudry & Co., 70 Kilby street, Boston, is designed for a large range of work. There are two plungers, actuated by a belt, and they can be both operated, or either one can be stopped, at pleasure. The strokes of these plungers are readily varied, and their motion can be arrested at any desired point, without shifting the



Duplex Forging Press, Punch and Shears.
Made by Messrs. BEAUDRY & CO., *Boston, Mass.*

belt, by pressure on the proper foot lever. Dies, punches or shears can be fitted to the plungers, according to requirements, and the action, being a steady pressure instead of a jar or blow, is said to be especially favorable for the manufacture of machine or drop forgings.

The tool is made in several sizes to meet the wants of different trades, such as machine, boiler, blacksmith, cutlery and jewelry shops, and manufactories of pressed and stamped wares. It is strongly built, with cast steel crank shaft. The medium size machine has a stroke varying from 2½ to 3 in., a throat space of 26 in., a pulley 30 in. in diameter by 6¼ in. face, making 200 revolutions a minute; occupies a floor space of 7 × 4 ft., and weighs 10 tons. It is designed for shearing 3-in. round iron, 10 × 1¼-in. flat iron, and punching 2½-in. holes in 1-in. iron.

Railroad Legislation in England.

By the bill introduced, Sir Michael Hicks Beach and Baron De Worms propose to enlarge the powers of the Board of Trade very considerably. The board are to be empowered to order a railway company within a specified time (*a*) to adopt the block system on any or all of the lines; (*b*) to provide for the interlocking of points and signals on all or any of their lines; (*c*) to adopt an approved system of coupling; and (*d*) to provide for all their passenger trains continuous brakes, which must be instantaneous in action, and capable of being applied by the engine driver and guards, self-acting in the event of any failure in continuity, capable of being applied to every vehicle of the train, in regular use in daily working, and, lastly, made of durable materials, easily maintained and kept in order. Already companies are bound to make half-yearly returns to the Board of Trade of their continuous brakes.

Secondly, the board may in their absolute discretion order a company to provide a subway, bridge, or foot-bridge at any station, or to provide a subway, bridge, foot-bridge or lodge at any place where the railway crosses a public carriage road on the level.

Thirdly, every company is to make periodical returns as to the persons in their employment whose duty involves the safety of trains or passengers, and who are employed for more than twelve hours at a time.

Lastly, it is proposed to enact penalties for avoiding payment of fares, instead of leaving the company to act under their own by-laws. The suggestion is, that every passenger shall, on a request by an official of the company, either produce his ticket, pay his fare, or give his name and address, and on default the maximum penalty is forty shillings. And he may be detained by any official or constable. If he travels (1) without paying his fare, and meaning to avoid payment, or (2) goes beyond the distance for which his ticket is taken without paying the additional fare, with similar intent, or (3) gives a false name and address, the penalty is 40*s.* for the first offense, and a £20 fine or a month's imprisonment for a second offense, this liabilty to punishment not prejudicing the recovery of the fare.—*The Law Times* (London).

TECHNICAL.

Shop Notes at Altoona.

The shops of the Pennsylvania at Altoona are busy with new orders for locomotives and cars. The renewals alone require large forces of men. The mechanical department is always busy with new projects and designs to keep abreast of the times and ahead of foreseen difficulties. During the flood the losses were so great, and the demands upon the mechanical department for both men and material so severe, that it has hardly yet recovered. The consideration of the most advisable methods, designs and tools for the new locomotive shop is an ever-present problem, and will continue to be a large item of daily labor for some time yet. The new Class P locomotives are running and doing well. They carry 185 lbs. pressure and burn anthracite coal. The steam heating system brought out last winter will be placed on 100 passenger cars during the coming season. The new dynamometer and track inspection car is being used on the New York division; it has already made diagrams from a considerable portion of the main line.

Shops of the Union Switch & Signal Co.

One place of interest in the vicinity of Pittsburgh is the Union Switch & Signal Co.'s works at Swissvale, about a half-hour's ride from the Union Station. Here can be seen a variety of apparatus in actual operation. The visitor is recommended to ride on the rear platform or on the engine from Pittsburgh and see the operation of the electro-pneumatic block signal apparatus. This system is automatic, and was described at length in the *Railroad Gazette* of Aug. 23 and Sept. 6. The works are running on the new interlocking for the Grand Central Station in New York City. A new 92-lever machine is building to take the place of the old one. A novel scheme of changing the connections without interfering with the traffic was adopted. The new connections were put in position and connected up without removing or disturbing the old ones and were adjusted to work harmonicously as to position of switches before the old ones were removed. At the Swissvale shops also is being made the largest electro-pneumatic signaling and interlocking table yet constructed. It is for the Union Station at Kansas City. This system also has been fully described in the *Railroad Gazette* within a few months. By the great number of uniform parts this class of work is peculiarly adapted for the advantageous use of special machinery. The supply of templets, jigs, etc., is here so complete that the men work practically without drawings until the time of erection of the complete machine. Special milling machines adapted in some cases from old tools, and multiple drills, can be here seen. A handle-turning device made from a common lathe, in which one long cutter passes under the rough handle at an angle, and which, as the handle turns, shaves off the metal and completes the irregular finish without the attention of an operator, is a curiosity. In the smith shop a drop-forging press turns out wrought-iron bell cranks at a cost less than that of malleable iron, and in most excellent form and shape. Locomotive builders who still adhere to the old hand work and clumsy cast iron details could learn a lesson here. In the pattern shop in process of construction is a novelty in plate pattern work. Grooved wheels with grooves cast in, made without splitting the pattern in the plane of the wheel—that method taking up too much room in the molding machine—can only be made by the plan adopted here, which is to mount half-wheel patterns on a shaft, and, instead of drawing them from the mold, to rotate them around the axis until they are wholly removed therefrom. With a plate wheel this makes a quick and simple way of producing many molds in a small machine. The Westinghouse friction buffer is made at these works, and a testing machine by Riehlé Brothers has been recently added to this department.

Car Heating.

The Standard Car Heating & Ventilating Co., at Pittsburgh, is driven with work for the repairs and reconstruction of the shops of the Westinghouse Electric Co., which were recently damaged by fire. Car heating is not the only class of heating work done at these shops. Recently they have furnished all of the details for heating the new offices of the Westinghouse companies in Pittsburgh and they turn out a good deal of work for office buildings, factories and dwellings. At present they have completed the designs for their car heating apparatus for this winter's use, embodying the results of last season's experience and introducing new features which bring the details abreast of the present knowledge of the subject. A new gravity trap which cannot be injured by freezing and which will operate all the better for the shocks it receives in service, adapted for either a direct or return system of car heating; a new ejector for producing a vacuum on the return pipe and a new design of steam coupling between cars, the result of Mr. George Westinghouse's personal investigation, are among the novel improvements. This coupling is worthy of especial mention because of a radical departure from existing designs. It obviates the necessity for a slip joint and reduces the cost of hose and increases its life materially. Its construction is about as follows: In the place of the usual hose is a piece of wrought-iron pipe, covered with a non-conducting material, to the coupling end of which is attached a coupler which makes a butt joint and a straight-away passage for the steam. This coupler is held tight by the weight of the pipes and couplings acting with a long leverage such as to insure its freedom from leakage. In service there are no strains which will tend to make leakage at the coupling, but tighten it. Thus the single or double lines of conductors between cars may be said to be straight, rigid connections, not subject to distortion by the movement of the cars—the angular motions being provided for elsewhere—and containing only one joint that is to be separated in service, and none that moves in service. In the coupler is a rubber packing with a spring backing, the spring being protected from the action of the steam. This coupling is automatically separated when the cars part, and is distinct from that part of the connection which allows the necessary motion. At the end towards the car the straight pieces of pipe pass through a semi-spherical bearing which, while it holds the pipe vertically, allows it to assume any angular or longitudinal position, within wide limit, without binding or allowing too much freedom to cause rattling or wear. Passing through this support the pipe reaches a short, straight piece of steam hose located under the platform away from all danger of damage, well protected by bands of copper, and secured with permanent positive connections to the train steam pipe. This piece of hose is straight, and its angular movement is only a few degrees; therefore, it will be seen the service required of the hose is so small that long life may be expected. The Standard Company expects with this device to remove all the difficulties thus far met with in steam connections between passenger cars, and by it provide a straight-away, level, automatic, flexible coupling device. Visitors to these works can see the whole apparatus in operation, and the superintendent, Mr. Taggart, is prepared to exhibit the system under all conditions of angular motion, shocks and extreme pressures. An experimental car showing the indirect system of car heating is mounted in the yard, and connected ready for exhibit.

Magnolia Metal.

The beautiful new steamship "Kaiser William II.," of the North German-Lloyd line, on her first trip to this country, several weeks since, was detained two days on the way from hot journals. On her arrival the chief engineer caused the steamship's journal bearings to be lined with Magnolia metal. She sailed while the great storm was raging that wrecked so many vessels and devastated the Jersey coast, about three weeks ago, and arrived in Europe on time without suffering from hot journals at all. The Magnolia metal went into her thrust bearings. This is one of the severest tests that an anti-friction metal could be put to, because the "Kaiser William II.'s" journals were badly cut up by the metal that was taken out which caused the detention, and the Magnolia metal had to stand that disadvantage to begin with. Claim No. 6 of the Magnolia metal reads: "It is the only metal that protects and does not wear journals; it enamels them." Samples of the metal that melted out of the steamer's bearings can be seen in the office of the Magnolia Anti-Friction Metal Co.

The Merchants' Bridge, St. Louis.

Work at the Merchants' Bridge has received a temporary check on account of difficulty in placing the caisson for the last pier situated in mid-river. The water is 38 ft. in depth and the current swift. The caisson proper is below the surface several feet, its north end resting on the river bed in good position. Several tiers of heavy masonry are laid on the caisson. The pumps are working well and the air pipes for supplying the lower or working chamber are being arranged. The great depth of the water and possibility of a rise in the river necessitates the building of the cofferdam much higher than it is at present, which is being done. The uneven bottom of the river where the last caisson is being placed has delayed matters somewhat. The sand-hogs—as the men who work beneath the caisson term themselves—have been laid off for a few days, while the carpenters work at the cofferdam. The rapid current and the swells raised by passing steamers cause a heavy strain on the cables holding the caisson, flatboats and barges which compose the outfit. The piling and concreting for the approach along Ferry street is finished and the iron caps placed ready for the erection of the superstructure.

Trial of a Storage Battery Car.

A trial trip of one of the storage battery cars of the Union Electric Car Co., was made Sept. 27 over the four-mile Beverley & Danvers Street Railroad, near Boston. The trip was a perfect success, and was made in less than 20 minutes, a speed of from 16 to 18 miles being easily made, although the road has very steep grades. The road will be opened to the public in a few weeks.

Naval Affairs.

Advertisements have been issued by the Navy Department for proposals for steel for use in the construction of the two new cruisers, of 3,000 tons each, known as Nos. 7 and 8, which the government will build at the New York and Norfolk Navy Yards. Bids will be opened Oct. 31, the delivery of steel to begin within 30 days from the date of the contract, and to be completed in six months. The steel called for is all that will be necessary in the construction of the two hulls, and is divided into six classes, on which bidders may make separate proposals. The material advertised for aggregates 1,131 tons of steel. The largest items are 826 tons of steel plates, 106 tons of steel shapes, 83 tons of steel castings, and 70 tons of rivets.

The Secretary of the Navy recently ordered an inspection to be made of the facilities of the Portland Company, at Portland, Me., for constructing vessels of the navy. Chief Constructor Wilson and Engineer-in-Chief Melville, who made the examination, have reported very favorably on the subject, saying that the works could in a reasonably short time be fitted to do government work in an entirely satisfactory manner, and to build iron vessels of from 1,000 to 3,000 tons displacement. This company intends to bid on some of the new vessels.

Canadian Pacific Elevators on Lake Superior.

The Canadian Pacific is to increase its elevator capacity at Fort William, Ont., by 1,500,000 bushels by building an annex to elevator "A," which will bring the total storage capacity owned by the Canadian Pacific at the head of lake navigation to nearly 5,000,000 bushels.

The Canadian "Soo" Canal.

Mr. Hugh Ryan, one of the contractors for the construction of the Canadian canal at the Sault Ste. Marie, states that work is going ahead rapidly, and will probably be completed before the specified time. The canal is two-thirds of a mile in length, and will have a mean width of 150 ft. and a depth of 18 ft. below the lowest water lines. There will be one lock, 600 ft. long, 85 ft. wide, with a rise of 18 ft. The contractors expect to finish their work long before May, 1892, the time specified for by contract.

Jull Snow Excavators on the Union Pacific.

The Jull Manufacturing Co., of Brooklyn, has sold the Jull centrifugal snow excavator, which was successfully tried last March on the Rome, Watertown & Ogdensburg road, to the Union Pacific for $15,000, delivered at Rome, N. Y. This is the first excavator built by the company. The Union Pacific has also ordered a second excavator at the same price.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

With the autumn there has come a very general anticipation of good business and higher prices. Although quotations of finished iron and steel and merchant steel have advanced little, if at all, for months, sales have increased and quoted prices are more easily got. In rails prices have advanced within a few weeks and the mills are busy, notwithstanding a very small mileage of new road built. The car, locomotive and bridge builders are all busy, and the car builders especially are expecting further large orders to be placed very shortly. We are told that prices of locomotives are advancing. In rolling stock the business of the year will apparently be considerably greater than last year. We have made no careful canvass, but an examination of the orders, notes of which we have published from week to week, shows nearly 25,000 freight cars ordered in the four months ending Sept. 30 this year, against 12,250 in the same period last year. For the same period we have noted 375 locomotives ordered this year and 352 last year. With the good crops and the greatly increased earnings which the railroads are now making, we may reasonably expect, not a boom, but a fine fall business.

In our issue of June 28 was published the admirable report of the Master Car-Builders' Committee on Standard Brake Gear, and on July 5 we published also the general arrangement, the details and the dimensions recommended by the committee. Commenting on this report at the time, we said that whatever might be its fate in the Association, it would certainly have far-reaching results; that the dimensions and design of details would be made standard on various roads even if not made standard by the Association, and that the importance of better brake gear was put before the railroads in a definite way that would command attention. We have good reason to think that such has been the effect of the report. There is evidence that many railroad officers have taken into serious consideration the actual and the proper condition of their foundation brake rigging as a result of the recent agitation of the subject and of the committee's report upon it. Now the Master Car-Builders' Association has by letter ballot adopted all the recommendations of the committee as the standards of the Association. It will be noticed that the report is adopted by a very strong majority vote, also. Out of 464 votes cast there were but 29 or 30 negative ones on most of the specifications. The recommendation which met with the greatest opposition was the one concerning the strength of brake beams. The committee recommended that these should be made to stand a load of 7,500 lbs., with a deflection of not more than $\frac{1}{16}$ in. for freight cars now built, and to stand a load of 15,000 lbs. with $\frac{1}{16}$ in. maximum deflection for passenger and freight cars in the event of the use of a larger cylinder or of a device for graduating the brake power in proportion to load and speed. On this recommendation, out of 460 votes cast, there were 97 negative. It was to have been expected that these requirements should be thought excessive, and knowing the sentiment of a good many master car builders, we are surprised that no more than 97 votes were cast against the committee's recommendation. It is evident that the argument of the committee and the very careful tests which they carried out at Altoona have borne fruit.

The association has adopted also the specification and guarantee for cast-iron car wheels which were presented at the Saratoga convention and which we published in full July 5. Besides providing for careful test and inspection, a service guarantee is made also. Under this guarantee the buyer makes an absolute payment for a new wheel of about its scrap value. After that he pays for the mileage made by the wheel. This method of purchase promises to give the buyer all possible economy and safety, and to give the maker of good wheels a proper advantage over the maker of poor wheels in competition. After he once gets his wheel into service it earns him a royalty every time it turns. It therefore puts a direct premium upon making wheels that will do something more than just pass an inspector. Nevertheless, the guarantee was barely adopted on the letter ballot. Out of 440 votes cast 128 were against it. The number necessary for adoption was 294, therefore there were but 18 votes to spare. No other one of the recommendations adopted came so near defeat. This we regard as unfortunate, for this form of guarantee is the most complete and just all around of anything yet proposed, and it ought to go before the buying officers with such a general indorsement as would secure its thorough trial.

It hardly seems necessary to argue that strong cars are safer in wrecks than weak ones, or that it is worth while to consider security in building passenger cars. Yet there are those who hold that, however stiff and strong a car may be, it will be crushed in a serious wreck, and that a car practically indestructible in accidents is not attainable; and it does not seem right to allow an example like that of the Palatine wreck to pass without calling attention to its lesson in this particular. The two cars in the rear of the first section were private ones and especially strong. They were but little injured, while the third car ahead was badly telescoped. The vestibuled cars in the second section also escaped without injury. If the rear cars in the first section had been ordinary day coaches we may fairly suppose that they would have been ground to pieces. The idea of building lighter day coaches and sleepers in order to reduce the dead weight is occasionally brought forward still, but in the light of such experiences as this it seems untenable. Further, let us suppose the first section of the train had been composed of English or Continental cars, with their light superstructures and bodies just resting on the main sills. The result would have been that the bodies would have left the under frames, and probably all of them would have been overturned and a majority of them crushed. There is now no question in the minds of most railroad men that the vestibule is an additional safety, although they regret the additional dead weight. The direct resistance to crushing given by the vestibule is probably not so important as its effect in steadying the train and in keeping the platforms in line and level. Fortunately the experience with vestibuled trains in wrecks has not yet been sufficient to give us many actual data, but such as we have go to confirm what might be expected.

The Superintendents' Association meets in New York on Monday next. The committee reports announced in the Secretary's notice will certainly afford ample ground for profitable discussion, even after excluding the mechanical and engineering topics. The work of this association has been criticised on the ground that the members were stepping a little outside of their own department in discussing details of railroad construction, equipment, mechanical appliances, and other matters of an engineering nature. It is true that to be an intelligent and efficient superintendent a man should at least understand the fundamental principles governing the best practice in these departments, and it will be readily agreed that the details also should be studied so far as time can be found for that purpose; but life is short, and with the present wide field for improvement in things which master car builders, master mechanics and roadmasters *cannot* do and which superintendents *must* do, the essence of the criticism must be acknowledged to be just, and the views of those members who desire to see more systematic attention given by the association to questions of general operation, the economical handling of the company's resources and allotment of expenditures, the management of employés and the arts of dealing with the public, must be recognized as correct. The deduction of the best principles of practice from the mass of information that ought to be readily accessible to the Association should be the subject of careful thought. It is peculiarly true of superintendents that each one has his own methods and often builds up his own system, quite independent of his neighbors and of the lessons that might be learned from them. These subjects are not particularly easy to work up an interest in, because they involve many very knotty problems. The best of superintendents must often say "I don't know" to the questions that come up: but this only the more clearly proves the need of discussion and of the processes by which mind sharpeneth mind. The last meeting was not an unprofitable one, and the full report of it, now in the hands of members, should suggest a number of starting points for the work of the coming meeting. Not to lay out too much work for a single meeting, we would suggest—if members do not talk freely—the reporting of experience with the Standard Code of Train Rules. There is no danger that the Time Convention will exhaust the subject. Many of the best members of that body are burdened by an enormous pressure upon their time and ought to welcome concise discussions of details by this body. Some pertinent queries concerning train rules are suggested in the long editorial below. Members who still think technical subjects the most available material to work upon might take up interlocking. That is a live question, one which vitally interests superintendents—in operation if not in construction—and one on which many superintendents need an accession of enthusiasm.

The most interesting subject to come before the meeting of the Time Convention to be held in New York City next Wednesday is the car-service question, including the car service associations, which were made the subject of a special report published in the *Railroad Gazette*, Sept. 20, and which constitute that department of the work which we should speak of as demurrage if it were not such horribly "bad form" to use that time-honored word. Some few lawsuits are still pending or threatened, and probably those members who have enforced collections for detention of cars can relate a considerable variety of experience with "kickers," but on the whole the very successful and hopeful results at Omaha, Chicago and on the New York & New England seem to have been repeated in nearly or quite every instance where the reform has been started, and this meeting should give the movement renewed momentum. This helps to pave the way for improvement in the system of settling for interchanged cars, but it remains to be seen what the feeling will be on that broader and more difficult question. It is to be hoped that the gratifying increase in the supply of cars resulting from the lessened detention at stations already accomplished will not blind the eyes of managers to the wrong principles involved in the simple mileage system. It were better that the reform should not progress so rapidly.

The Inter-state Commerce Commission has heard a complaint from the Toledo Board of Trade, and has refused to hear one from the Inter-state Commerce Railway Association. Probably the Board of Trade was incorporated, while the railroad association was not. At least it seems as though the distinction must have been based on this ground, for hardly any other would be tenable. It would be in the highest degree illogical to require individual railroads to be parties to a complaint and not make the same requirement of individual merchants under similar circumstances. The reasons for having a railroad association bring railroad complaints are even stronger than those for letting a board of trade bring shippers' complaints. The grievances of a board of trade arise directly from injury to its members; the grievances of a traffic association arise from violations of the agreement on which it is founded, rather than from direct injury to the parties composing it. It is the body as a whole that suffers rather than the particular members. It is to be hoped that some way may be found for giving the association a *locus standi*. We can at this distance see no reason why an act of incorporation should not meet the requirements of the case.

The Government Commissioner of Railroads, in his annual report to the Secretary of the Interior, advocates that the Pacific railroad companies be given an extension of time on their debt to the government; that the interest rate be reduced to three or four per cent., and that provision be made for interest and sinking fund by compelling the payment of a percent-

age of gross earnings. The Commissioner admits that he has been unable to give adequate time to this part of the subject. Under the circumstances we think it would have been wiser for him not to touch it at all. The gross earnings percentage plan hardly seems a good one to adopt. It has the effect of preventing a railroad from making reductions in rates. Such reductions are apt to increase gross earnings; but they also increase the expenses, because the volume of traffic becomes larger, so that the increse of net earnings is almost always very slight. If the increase of gross earnings necessitated increased payments to the government, a slight increase of net earnings would be accompanied with an actual reduction of profit to the company itself. No worse obstacle to progress could well be imagined. A fixed payment, whatever its disadvantages, would be far better than this. The proposals about interest rates and sinking fund payments are left too vague to be seriously discussed. We are not told how the sinking fund is to be invested, nor how to avoid the evil effects of the present system of handling it. The whole report reads as though the writer had not familiarized himself with the difficulties of the subject, as brought out at the discussion in the last session of Congress.

The Palatine Bridge Collision.

The rear collision on the New York Central last week is the worst disaster on that road since the similar one at Spuyten Duyvil, in January, 1882, and it attracts especial attention because it happened on one of the roads doing the heaviest passenger business in the United States, and one which carries many millions of people annually in great security. Last year it carried nearly 18,000,000 passengers. Its tracks are excellent, and it advertises "The Fastest Train in America." The trains involved in this wreck were not the fastest on the road, but were substantially equal to the Chicago limited in nearly every respect. The particulars of the accident, as near as they can be gathered, are as follows:

On Friday night, Sept. 27, about 11:30 p. m., the second section of the St. Louis express, No. 5, westbound, on the New York Central & Hudson River, ran into the rear of the preceding section, which had been stopped on a curve about four miles west of Yosts and about two miles east of Palatine Bridge, which is 55 miles west of Albany. The second train was running at probably 50 miles an hour, which rate is said to have been reduced to about 30 before the forward train was struck. The rear car of the latter was the new official car of President Ledyard, of the Michgan Central, and the one next in front of it was the official car of President Ingalls, of the Cleveland, Cincinnati, Chicago & St. Louis. The first mentioned was very strongly built, and the other was older but strong, and was somewhat narrower than the Wagner sleeping car just ahead of it. The two private cars withstood the shock so well that they transmitted the force of it chiefly to the Wagner sleeping car ahead of them, Mr. Ingalls' car having telescoped the sleeper for two-thirds its length; and here most of the injuries occurred. Four passengers were killed and 12 or more injured. The engine of the first section had blown off a steam chest cover a few miles back, and the engineer, instead of stopping, proceeded at reduced speed, expecting to reach Palatine Bridge. This slow running reduced the interval between the two trains so that when the rear brakeman, just before the train stopped, ran back with his red light, he was too late to give the following runner more than a very brief warning. The prescribed interval of time between trains is reported to be ten minutes, though the general rule of the New York Central specifies only five minutes. There are indicators at the stations showing each engineer the time at which the train preceding him left. It appears that these trains were about seven minutes apart at Fonda, five miles east of Yosts. Apparently the indicator at the latter station is not operated at night. The road is level at the point where the disaster occurred, but the view is said to be short on account of the curve. There is no evidence but that the automatic air brake was in working order. The engine was equipped with the driver brake, but the train, which consisted mainly of eight heavy vestibule sleeping cars, probably all 12-wheeled, doubtless had brake shoes on only four wheels of each truck, making the percentage of the load braked much too small for the highest efficiency. There was one Boston & Albany baggage car at the front, which was crushed by running upon the tender. The engine was No. 683, and the engineer was badly injured, the roof of the baggage car having crashed into the cab. The adjoining tracks were obstructed, and a freight train approaching on one of them was stopped barely in time to prevent running into the wreck.

The immediate cause of this accident is plain. The first train should have stopped at once when it was seen that the regular speed could not be kept up. The blame is laid on the engineer of the disabled engine for not so stopping, and we believe this view is held by the officers of the road who have talked with reporters; but the conductor of this train seems to us almost equally blameworthy. The flagging rule goes into effect whenever a train "is only able to proceed at a slow rate," and the code throws upon the conductor the joint responsibility with the engineer for properly guarding against following trains, and both of them should have been continually on the alert, when they knew that a fast train was following them within only 10 minutes, and possibly less. At 50 miles an hour the second train would be only 8⅓ miles behind the foremost, and with a shorter interval the margin for errors is very narrow. With seven minutes' interval a brakeman traveling at 6⅔ miles an hour, one-eighth the speed of the train, would meet it in about 215 rods (⅝ mile), and with five minutes' interval they would come together in about 142 rods, less than half a mile. In view of these facts, any careful conductor or engineer should need to reflect but little to make him feel extremely nervous at every slackening of his own speed. Whether it is fair to the men or just to the passengers for the management to run trains so closely as to necessitate this onerous mental burden on the men in charge of a heavy passenger train we will not now discuss. Doubtless there will be offered some defense of the engineer's action. It may be claimed that he was using his best judgment; that he had to get on to a side track as soon as possible, and that his error was only one to be expected even of a clear-headed trainman; but if the rule to *take no risk*, which is universal on all roads, is ever to have any force, this was an occasion for it.

While the New York Central's rule contains the clause which requires a flagman to go back when his train is losing time as well as when it is stopped, many will be interested in the Time Convention's position on this point. Rule 99 of the Standard code says that when a train "is stopped" the flagman must go back. The Time Convention Committee doubtless recognized the difficulty of formulating a rule by which brakemen could be clearly instructed as to what action should be taken when a train slackens its speed but does not come to a full stop, and they were, perhaps, warranted in promulgating this rule in this way. Each manager was left free to make amendments in any proper way, and the committee can claim with reason that they are not responsible for any dangerous omission. The rule of the New York, Lake Erie & Western, which adopted the standard code a year and half ago, reads: "When a train is stopped, or when it fails to make its running time." This certainly is a rational provision, and one to be always kept in mind, whatever we may say about the impracticability of enforcing it. Every manager expects his trainmen to keep it in mind as an unwritten rule, whatever he says or omits to say in his code. The Erie's and the New York Central's provisos clearly impose upon the brakeman in a case like this the duty of stopping his train (or slackening it sufficiently to enable him to alight), whenever the time comes for him to go back. This is an important and delicate subject, and it may be doubted if the brakemen generally, either on the Erie or the Central, clearly appreciate the critical position in which the rule places them. To order a stop by means of the bell-rope, when the engineer "is supposed to know his business," is not a thing that brakemen are in the habit of doing. It may be said that the conductor should bear the whole responsibility at this point, thus relieving the superintendent of the care necessary to secure sufficiently intelligent brakemen in every case. In either case, the promulgation of such a rule without careful examination to see that it is understood, which examination is the rare exception on railroads generally, is a risky practice.

In the prevailing American practice of trusting to a flagman for protection from rear collisions, the risk is admittedly considerable, and the use of a powerful train brake is not only a recognized agency for mitigating that risk, but has probably come to be an element which constantly tempts men to take increased risks. As it comes to be more and more fully recognized that a passenger train can be stopped very quickly, conductors and brakemen are more and more liable to take the chances of not sending a signal back with promptness. But whatever may be said about the viciousness of this tendency, it cannot be denied that braking appliances still fall far short of the high standard of efficiency which it is possible to attain. The dangers involved in running numerous 12-wheeled cars with only eight wheels braked; in running engines without any brakes whatever, and in running old or weak brake rigging, which is supplied with efficient pressure apparatus, but which is unequal to the service imposed upon it by the powerful air apparatus now used, have been so recently discussed in these columns that there should be little need of rehearsing the facts here. On Aug. 30 we gave some illuminating figures concerning an actual collision resulting from insufficient brake power, and a case, in which a train similar to that on the New York Central ran 2,000 ft. before it could be stopped, was recently mentioned and will be recalled by our readers. The recent stop of an English train, by the rupture of a hose, in 630 ft., when running at 50 miles an hour, at once disposes of the assertion that good stops are made only on exhibition trials.

But all the foregoing leaves out the block system—really the most important consideration of all. In discussing serious train accidents, in which men have failed to do their duty, the argument is brought forward, often by railroad managers of experience and reputation, that some blunders must be expected; that human fallibility is irremediable; and that in the more persistent arguments (such as frequently appear in these columns) the matter is carried to too fine a point; in short, that perfection is unattainable. But this is just the argument which tells most strongly in favor of the block system. Admitting, for the sake of argument, that the men who fail have at some time or other fully comprehended the nature of their duty—which admission generally can be made *only* for the sake of argument—it still may be safely said that those railroad directors who have adopted the block system have been largely influenced by this very consideration. Assuming that men will err, they have adopted the system which logically promises the least chance of error.

The considerations which go to show that a block system is better than the time interval and flagging system are so conclusive that it is really a matter of but secondary importance that exact statistics are not available to absolutely prove this superiority from actual experience. That a fixed point, at which an engineer must look for a danger signal, is safer than requiring him to look for it constantly; that a man who makes it his business to constantly protect trains is less likely to err in judgment than is a brakeman who has other duties, and whose chief aim often is to reach the end of the trip as soon as his engineer does, is as evident as is the fact that a space interval is incomparably safer than a time interval. The inevitable percentage of mistakes, so much talked of, results largely from lack of discipline; and the maintenance of proper discipline is, in a block system, boys' play as compared with the difficulties in making brakemen go back to flag. A superintendent of one of the best disciplined roads in the country acknowledged that his rear brakeman obeyed the flagging rule *when he* (the superintendent) *was on the train.* We have assumed that mathematical proof of the superiority of block signaling is unavailable, and in view of the many differences of conditions in American and European practice it is perhaps well to rest on that assumption; but it is a significant fact that of the 1,290 accidents investigated by the British Board of Trade in the last thirteen years only 55 (about 4 per cent.) were rear collisions. Ninety-four per cent. of the double track road of the United Kingdom is worked under the block system, and we may rest assured that no rear collision of passenger trains would go uninvestigated. The reader will bear in mind the dense traffic of the principal English roads, as well as the fact that this list of 1,290 accidents includes only the more serious cases.

Various arguments are offered against the block system by those who do not use it. It is undeniable that collisions do occur where it is ostensibly used. A considerable share of the serious train accidents happening in Great Britain, and reported periodically in these columns, occur from mistakes of signalmen or engineers who are working under a so-called block system, and one case in particular will be recalled, that at Meadows, New Jersey, in October, 1885, where a number of people were killed by the error of a signalman who gave a clear signal when the section was occupied, and, we believe, claimed that he looked at his train register at the proper time, and that his error was in reading figures that really did not appear on the sheet. This last case shows the loophole which exists in even the best ordinary block systems; but even here there was no electric locking. By far the greater part, however, of the serious collisions in the class we now refer to occur at times when the strict requirements of the block system are relaxed, and this relaxation is generally shown to have been permitted by the officers of the roads. The Hexthorpe (Eng.) disaster in September, 1887, is an example. The Pennsylvania, which has the largest mileage of block signals in this country, uses the blocks permissively where no passenger train is involved, and the New York, New Haven & Hartford, which has lately equipped 60 miles at great expense, largely neutralizes the value of the signals by using them permissively, even for passenger trains. Its block sections are too long and the resulting delays are so irksome that the safeguards are deliberately thrown aside. The Sykes electric locks, which are used on the New Haven road and represent the highest perfection in block signaling, are of little value when permissive blocking is allowed. The only important stretch of road that we know of in the United States on which an absolute block system, protected by the Sykes locks, is invariably used for all trains, is on the New York Central itself, between the Grand Central Station, New York City, and Spuyten Duyvil and Woodlawn.

All permissive blocking of whatever degree or kind has elements of danger which can in no way be laid to a block system, properly so-called, and it is a fallacious argument, and one which deceives the public, for rail-

road men or any one else to attribute accidents occurring under such circumstances to the block system. The public, notwithstanding the vague character of its knowledge, knows enough to see that a train which is kept a mile in the rear of the one preceding it cannot run into the latter; and it is silly, not to say wicked, to befog the public mind by misstatements or partial statements about the efficiency of the means for preserving this distance interval.

Every one knows, however, that the financial question is often, if not generally, the ruling consideration in railroad matters, and without stopping to argue fine points, the public will ask why the New York Central directors have not adopted a safer system. That they have the block system on a portion of their road shows that they appreciate its value. The equipment of 500 miles of road, with the proper buildings and fixtures, and the maintenance of the system afterward is an important item, but knowing the Central's immense traffic, people will at once make comparison with the Pennsylvania, which maintains a system at large expense on a mileage greater than the Central's main line. There is also a suggestive question for all directors in the differences of practice observable in different parts of the same system of roads. Instances of the most divergent practice on roads owned or controlled by the same interests are as common and noteworthy as they are inexplicable; but the spectacle of the West Shore, a Vanderbilt road, using the block system, and the New York Central, a much larger Vanderbilt road, doing without it, is a glaring instance of this state of things. The New York Central acquired control of the West Shore after its block system was established, and of course the usual arguments in favor of a conservative policy apply here; but when it is considered that the block system entails a large annual expenditure, the query at once comes up whether the practice of the two roads should not be made more nearly uniform? If the great expense is unwarrantable, why should not the directors abolish the system on the poor West Shore? If the system is a necessity in safe train working, why should it not be adopted on the more prosperous New York Central?

We have given only fragments of the arguments in favor of the block system, and must here omit all mention of the lessons concerning strongly built cars deducible from a view of this wreck. On the looseness of view among superintendents concerning the proper length of the time interval between trains there is much to be said, but this has been commented on repeatedly heretofore. It is quite possible that the runner of the second section was not keeping the best possible lookout, and that, therefore, his own sufferings and those of the score of passengers may be attributed directly to his failure to apply the brake until six or eight seconds later than he should have done—the difference between life and death. But this and many other points will not be cleared up until we have a searching investigation, and very likely not even then.

Unprofitable Branches.

The question of the disposal of unprofitable railroad lines has come into discussion again by a decision of the Federal Court in Iowa. During the receivership of the Wabash, the United States Trust Co., trustee for the bondholders, applied to the court for an order to discontinue the operation of the Clarinda branch on the ground that receipts were not sufficient to pay expenses. The court now holds that it has no right to deprive the people of transportation, and that the Railroad Commissioners could make an investigation of the facts if they chose to. In their famous letter to the so-called Hepburn committee of the New York Legislature, in 1879, the presidents of the New York Central and Erie roads made the argument that their roads were performing delegated functions of the state. Has any railroad the right to abandon a branch? Can the charter granted by the state be considered a perpetual obligation upon the investors to run a road at a loss? It will be noticed that the Iowa decision above quoted does not cover this precise question. In the Wabash case the road was temporarily in the hands of the court, and the petition was that the court as manager of the road should stop running it. The decision is, therefore, just what might have been expected.

In the West the question of abandonment is complicated by the fact that usually the residents along the road contributed money or land toward building it, and hence in equity have a good claim against suspension, since they are in part owners. In a case of simple charter, under which capitalists have built a line afterward found unremunerative, the case of abandonment is not so easy of settlement. The Pennsylvania Railroad abandoned a New Jersey road a year ago and no complaint to the courts was made. If the New Jersey Legislature had declared the charter of the Pemberton & Hightstown forfeited, the attorneys for the railroad would rightly enough have argued against such confiscation of private property without compensation. How far is such an obligation mutual? It would not be just, on the other hand, to compel the Pennsylvania to operate a branch for the benefit of the public at a loss to itself. In this particular case the Pennsylvania offered every advantage to the local residents if they wished to operate the branch for themselves, besides buying up all outstanding obligations, so that no one was injured except the villagers who failed to furnish traffic enough to pay expenses.

Considering the extent of our railroads and their disjointed growth and lack of system, it is rather surprising that so few roads or branches are abandoned. It has generally been found possible to arrange train and station expenses so that at least expenses might be earned. Then railroad men have of late years been putting more value upon branch lines as feeders, even though not earning anything. The reports of the Union Pacific show a number of branch roads whose earnings fall below fixed charges (guaranteeed by the parent company), and yet whose contribution of traffic to the main line is confessedly worth much more than the obligation. In this light there are but few branch lines which, operated economically, do not give to the main lines enough additional freight and passengers to make them worth operating.

The German Railroads in the Year 1887-8.

On the German railroads, in the year to March 31, 1888, the distance run by locomotives was equivalent to 10,566 miles per mile of road, or to the passage of 14½ locomotives each way daily over the entire system. Very nearly one-third of the locomotive mileage, however, was made in switching, or as helping engines, or running empty, and the train service was equivalent to but 9.71 trains each way daily. The heaviest service on any one road was at the rate of 28¼ engines each way daily, on the Main & Neckar Railroad, and the lightest, 1.6 each way, on the Fischhausen & Palmnicken. The average of the Prussian State Railroads was 16.8 (engines, not trains). The Berlin City Railroad doubtless has a movement very much greater than that of the Main & Neckar, but its results are not given separately in the report for the German Empire.

The average mileage of cars on all German roads was:

Passenger.	Baggage.	Freight.	
22,702	28,760	9,690	miles per year.
62	78	26½	miles per day.

Which shows that in Germany, as elsewhere, the cars spend by far the greatest part of the time on sidings and at stations, or on shippers' tracks, waiting to be loaded or unloaded. The freight cars on the average ran loaded to 48¼ per cent. of their capacity, while the passenger cars had but 24¼ per cent. of their seats occupied.

The cost of fuel for locomotives was 4.2 cents per mile run; the cost per 1,000 *car-axle* miles, $1.42, or for a train of 50 of the ordinary four-wheeled cars, with a capacity of 22,000 lbs. each, the cost for fuel averaged 14.2 cents.

The direct expenditure for motive power, including engineers and firemen, cleaners, loading coal, fuel, oil, waste, packing, and taking on water, was 13.3 cents per *train-mile*, or about 10 cents per engine-mile. Including the expenses for maintenance of engines and tenders, coal sheds, water stations, pumps, etc., superintendence and general expenses, the expense was 22 cents per train-mile.

An interesting statement shows the average proportion of the seats occupied in passenger cars of different classes, namely:

Classes	1.	2.	3.	4.	All.
P. c. of seats occupied	8.45	19.85	25.36	30.16	24.28

The average earnings per passenger mile were 1.271 cents, against 1.283 the year before. On different roads the average rate varied from 2.03 to 0.928 cents per mile. The differences are caused chiefly by variations in the proportions of the different classes.

The largest passenger earnings per mile were on the very short line from Nuremberg to Fürth, where they were $15,662, its average rate of fare being 1.11 cents per mile.

The average freight rate was 1.393 cents per mile, which was 3¼ per cent. less than the year before. The average haul was 64¾ miles; the average car-load 8,008 lbs. *per axle* for loaded cars, and for all freight cars hauled, loaded or empty, 5,148 lbs. per axle.

The average cost of the railroads of the Empire April 1, 1888, was $97,065 per mile, but *capital* was $99,477 per mile. The average gross earnings the year before were $11,024 per mile, $1.56 per train-mile, and 3.98 cents per *car-axle* mile. The largest earnings per mile, $24,342, were on the Main & Neckar Railroad; the lowest were $718, on the Schleswig & Angeler. The average working expenses were $5,808 per mile, or 52.69 per cent of the earnings, and 82 cents per train-mile. The apportionment of expenses given is 10.38 per cent. for general expenses, 26.07 for the road department, and 63.55 for the transportation department.

The net earnings of the German railroads have been equal to the following percentages on their total capital in successive years:

Year to March 31....	1882.	1883.	1884.	1885.	1886.	1887.	1888.
Per cent	4.54	4.89	4.61	4.60	4.42	4.63	5 17

The average number of persons in the service of the railroads in the last year was 343,377, or 26.6 per mile of road worked. The average payment per person, including all allowances, was $265.

The number of accidents during the year (not including such as occurred in the shops) was 2,521, of which 1,741 were at stations and 780 on the open road. Among these were:

	Derailments.	Collisions.
On open road	146	29
At stations	362	220
Total	508	249

By all these accidents 463 persons were killed and 1,334 injured. There were 11.27 persons injured for every million train-miles.

There were 437 miles of narrow-gauge railroad in the Empire at the close of the year, an increase of 90½ miles in the year, in four different lines, making 16 different narrow-gauge lines in all. The sharpest curve on these roads is of 62 feet radius. Their average cost was $20,954 per mile; their gross earnings $1,686, and their net earnings $658, which was 2.85 per cent. of the capital of the roads in operation.

The time of the through trains making direct connections between New York and San Francisco, which is always a matter for elaborate study and calculation by any prospective traveler not intimately familiar with long routes, has been made the subject of a circular by the New York agency of the Southern Pacific Co., which is given below, as a good sample of some of the features which railroads should give to the public in time tables. It is so easy for the passenger agent who is posted to make up such a table, and there is so much work involved when the task is undertaken by any one else, that *brief* publications of this sort will be appreciated by ticket agents and the public, and should be much more common than they are:

TIME TABLE BETWEEN NEW YORK AND SAN FRANCISCO.

West-Bound.

	Runs daily.	Runs daily.
Leave New York	9.50 a. m. Mon.	6.00 p. m. Mon.
Arrive Chicago	9.50 a. m. Tues.	9.10 p. m. Tues.
Leave Chicago	3.00 p. m Tues.	10.30 p. m. Tues.
Arrive Council Bluffs	7.10 a. m. Wed.	6.30 p. m. Wed.
Leave Council Bluffs	8.00 a. m. Wed.	7.55 p. m. Wed.
Arrive Ogden	9.30 p. m. Thurs.	9.45 a. m. Fri.
Leave Ogden	9.15 p. m. Thurs.	9.15 a. m. Fri.
Arrive Sacramento	6.30 a. m. Sat.	3.40 p. m. Sat.
Arrive San Francisco	10.45 a. m. Sat.	7.45 p. m. Sat.
Arrive Los Angeles	7.25 a. m. Sun.	6.45 p. m. Sun.

East-Bound.

	Runs daily.	Runs daily.
Leave Los Angeles	10.20 p. m. Sun.	1.30 p. m. Sun.
Leave San Francisco	6.30 p. m. Mon.	4.30 p. m. Mon.
Leave Sacramento	10.30 p. m. Mon.	9.00 p. m. Mon.
Arrive Ogden	6.30 a. m. Wed.	6.10 a. m. Wed.
Leave Ogden	8.00 a. m. Wed.	9.45 a. m. Wed.
Arrive Council Bluffs	9.00 p. m. Thurs.	7.40 a. m. Fri.
Leave Council Bluffs	9.45 p. m. Thurs.	10.00 a. m. Fri.
Arrive Chicago	1.30 p. m. Fri.	6.50 a. m. Sat.
Leave Chicago	5.30 p. m. Fri.	8.50 a. m. Sat.
Arrive New York	7.30 p. m. Sat.	7.00 p. m. Sun.

Westbound both trains make the same through time, but east-bound there is the familiar anomaly, which no one can explain, except on the grounds of narrow "expediency, of a considerable difference in time. The east-bound train leaving San Francisco at 6.30 p. m. is the faster, and is only for first-class passengers; there are no second class sleepers on this train. The Southern Pacific runs semi-monthly trains to California from Baltimore, over the Baltimore & Ohio and Queen & Crescent route, via New Orleans without change of cars, the price for a berth from Baltimore to San Francisco in the second-class sleepers being $5.

The Vermont Railroad Commissioners have rendered a decision on the butting collision between a freight train and a special passenger train at Brooksville, on the Central Vermont, Aug. 30. They find the conductor and engineer of the freight guilty of "gross and inexcusable carelessness and forgetfulness," as they had in their possession, but entirely forgot, a special printed time table of the extra passenger train, which was run three days to take people to the horse show at Rutland. The case illustrates the difference between the practice of making all extra trains subordinate to all regular trains of whatever class and running them on telegraphic orders, and the older custom of issuing a special temporary time table and distributing it to trainmen one or more days before it goes into effect, giving certain extra passenger trains a classification between regular passenger and regular freight trains. The extra is directed to avoid regular passenger trains but is made superior to regular freight trains. The men in charge of the latter therefore have to keep the extra in mind during the whole time in which the temporary time table is in force. It is of course easy to drop into the careless habit of trusting to the memory under such circumstances, instead of keeping the circular constantly at hand or before one's eyes during its life, and it is probable that this is the way the men blundered in this case. By the more modern practice the train-dispatcher treats all extra trains alike, so far as concerns the form of the document in which he gives them the right of way over the road. Instead of issuing a printed notice, which men may perhaps mislay, he issues a train order in the regular form, which, even if the trainmen are disposed to slight it, is less likely to be so treated, because it is in the same form as other telegraphic orders which they are in the habit of obeying every day. Whether the extra be a common freight or a fast passenger train carrying distinguished passengers, the form of order is the same. The standard code recognizes the principle here followed by

making all extra trains inferior to regular trains of every class.

The New York Railroad Commissioners, in their report on the rear collision at Forest Lawn, Sept. 10, recommend station distant signals.

The matters raised by Counsel Gowen in the Rice case, now before the Inter-state Commerce Commission, were very important, and were carefully considered by that body. Rice asked for all the books and papers of a number of corporations which are not carriers—the Standard Oil Trust, the Armours, etc. The Commission says that papers of private firms cannot be called for unless specifically described and the urgent need of them is shown. It would be a gross hardship if everybody's private business could be dragged publicly before the Commission on mere supposition. Then the application is denied for the railroad accounts also. Railroads should furnish, and doubtless will, all necessary information about tariffs and traffic; but to demand that all the records of years shall be taken to Washington for mere examination in hopes of finding something damaging, is not just. Counsel in cases before the Commission again are requested to confer about the specific points of cases desired to be proved, and the Commission will see that the information is forthcoming if refused under such reasonable requests. This is an eminently sensible decision and suggestion. In the hands of some parties, no one's private affairs would be safe under an easy compulsion to produce all books and papers, to say nothing of the expense and trouble to parties in no wise concerned in the case before the Commission.

Through lake and rail rates from Chicago to New England points have been advanced one-half cent to 11½ cents per bushel on corn. To New York wheat has been advanced one-half cent and corn one-fourth cent. Oats to New York have been advanced one-eighth cent. These changes have been made by the Western Transit Co., controlled by the New York Central, and the other lines will doubtless follow. The dispatches indicate that the practice in making rates by these lines is somewhat peculiar. The change is said to affect only the proportion east of Buffalo, and yet it appears that it is the custom to vary the rates without notice. The changes above noted were announced ten days in advance, but the lines quote the lake and the rail rate separately, thus apparently evading the Inter-state Commerce law, so far as the water transportation is concerned.

Mr. Pullman, in an interview, says his company expects to operate two special limited trains the coming season to the City of Mexico, one running from New Orleans and one from St. Louis; that is, the Montezuma special, which ran last year to the City of Mexico from New Orleans (and part of the time from Washington) will be continued this year, and there will be an additional train from St. Louis. The company expects also to put on a special limited train service between Chicago and Florida. Pullman vestibuled trains are running now on the London, Brighton & South Coast, and recent contracts have been made with the London & Southwestern for the operation of vestibuled cars.

The Kansas Railroad Commissioners, on complaint of the cities of Winfield, Newton, Independence, Larned, Arkansas City, Humboldt, Salina and Great Bend, have ordered the Atchison, Topeka & Santa Fe, the Missouri Pacific and the St. Louis & San Francisco to extend to the jobbing and manufacturing business of these cities rates of freight equal for a like distance to the rates effective from Missouri River points and from Wichita (recently ordered by the commissioners), the tariffs to in all respects comply with the spirit of the Wichita decision and to take effect Oct. 15. The reduction will be about 20 per cent., and this action of the commissioners is only a logical sequence of their decision in the Wichita case.

Foreign Railroad Notes.

The Russian exports of petroleum and petroleum products last year amounted to 33,846,000 poods—223,483,600 gallons—small in comparison with the American exports, but no less than 87 per cent. more than in 1887. A not inconsiderable part goes to the Baltic at Libau by what seems a very circuitous route; that is, over the Caspian from the oil fields on its western border to the mouth of the Volga, up the Volga to Zaritsin and thence by rail in tank cars by routes 1,300 and 1,375 miles long west to Libau. The rail freight for this distance is about 38 cents per 100 lbs.

Russia is likely soon to make state railroads of two long lines, one 431 and the other 330 miles long, which are connected by a line 87 miles, which already is worked by the government. This may be a significant change. Russia has heretofore had very little state railroad, but has had to pay guaranteed dividends on a very large part of the Russian system. In Russia the government guarantees 5 per cent. on the stock of the railroads, which to a very large extent it has to pay; but it has contracted for a share when the profits exceed the guaranteed dividend. This was the case with the railroad which carried most grain to Odessa last year, when large crops caused unusually large net earnings. After paying fixed charges and the 5 per cent. guaranteed dividend, one-half of the remainder goes to the state as its "first share;" then enough for a 1 per cent. dividend; then one-half the remainder goes to the government as its "second share;" about one-tenth of the remainder goes to the employés, and the shareholders have the rest—amounting this year to 1.70 per cent., making 7.70 per cent. for the whole year.

Certain reductions in passenger fares were made on the Prussian state railroads April 1. These consist chiefly in a change in the rates of certain railroads formerly belonging to corporations, which had rates higher than the ordinary Prussian rates, to the general standard of the state railroads, and a reduction in the price of round-trip tickets by express trains. Tickets one way on these trains cost 9, 6⅔ and 4⅔ pfennigs per kilometre for the three classes, respectively, against 8, 6 and 4 by ordinary passenger trains. Heretofore round-trip tickets by express trains have cost one and a half times the express rate one way; now they cost one and a half times the fare one way by the ordinary passenger trains. On a journey like that from New York to Albany the reduction for the round trip will amount to 75 cents for first-class and 50 cents for second and third-class tickets. The return tickets, moreover, are made good for three days, instead of two; and when the passenger starts the day before Easter, Whitsunday, or Christmas, one day more is allowed. A species of family commutation tickets for use between large cities and their suburbs, which has been tried for a time at a few places, is now introduced generally on the Prussian state railroads. A principal ticket is issued to the head of the family at the regular commutation rates. The various members of his family receive what may be called "member tickets," for which only half of the commutation rate is paid, covering the same time as the chief ticket. If the tickets are not wanted for some time, they may be deposited with the railroad management, and then the time they are good will be lengthened by the time they are not used.

The Hungarian state railroads have established something like a "milling-in-transit" rate for flour shipments from Buda-Pesth to Fiume, the Hungarian port on the Adriatic. The export rate, which has recently been increased from 2.4 to 4 cents per centner (220 lbs.), applies only to flour equivalent in quantity to the wheat received over the Buda-Pesth & Fiume Railroad by the mills which ship the flour. Further, to encourage exports from Fiume, the railroad management has reduced storage charges at that port. Heretofore 21 days' free storage has been allowed, and, besides this, from April 1 to Aug. 1 the storage rate is reduced to 1 florin (40 cents) per carload per week, and after July (when the new grain will be coming in and the storage room may be all needed) it will be 0.2 cent per centner (220 lbs.) per day, which is equal to $1.40 per carload per week. The flour shipments to Fiume increased from 9,000 car loads in 1887 to 15,000 in 1888—say from 900,000 to 1,650,000 barrels.

There is talk of putting on a new "Oriental express train," to run from Hamburg to Constantinople, making the journey from London 12 hours shorter than by the present Oriental express from Paris to Constantinople, which runs twice a week.

The Hungarian state railroads last year earned, net, 4.55 per cent. on their cost, against 3.93 per cent. the year before. The earnings were about 8 per cent. greater and the expenses a little less than the estimates made at the beginning of the year.

TECHNICAL.

Locomotive Building.

The Union Pacific has ordered 47 new locomotives for different branches of service as follows: Ten six-wheel switching engines, standard pattern, 18×26 cylinders; five 10-wheel 19×24 passenger and fast freight engines, with 62-in. drivers, seventeen 20×24 10-wheel engines for the same service; fifteen 22×28 consolidation engines. The New York Locomotive Works will build all save the 15 consolidation engines, which will be built by the Cooke Locomotive Co.

The Baldwin Locomotive Works are now constructing 14 new locomotives for the Lehigh Valley road.

The Savannah, Americus & Montgomery road has now received six of the locomotives recently ordered of the Baldwin Locomotive Works. Two more engines are nearly completed, and will be delivered this month.

The Cleveland, Cincinnati, Chicago & St. Louis has let a contract for building 10 new ten-wheel engines.

Car Notes.

The Terre Haute Car & Manufacturing Co., of Terre Haute, Ind., has the contract for building 100 stock cars for the Cleveland, Cincinnati, Chicago & St. Louis. The cars are equipped with air brakes and Janney couplers. It is stated that the entire freight equipment of this road is to be fitted with air brakes and M. C. B. couplers.

Of the 30 passenger and baggage cars which the Rio Grande Junction road recently ordered of the St. Charles Car Co., of St. Charles, Mo., 22 have now been delivered. These consist of eight passenger coaches and the same number of second-class and baggage cars and six combination mail and baggage cars. The order for freight equipment will be delivered about Dec. 1. This consists of 150 box, 100 stock, 200 gondola coal cars and 50 platform cars, being built by the Wells & French Co., of Chicago, and the Litchfield Car & Machine Co., of Litchfield, Ill.

The Colorado Midland has let a contract for 500 box cars to the St. Charles Car Co. The cars are to be equipped with the Dunham car door, Westinghouse air brake and steel brake beams.

The Kanawha Dispatch has let the contract for building 200 box cars of 50,000 lbs. capacity to the Litchfield Car & Machine Co. The cars are to be equipped with air brakes and with passenger car trucks.

The Indianapolis Car & Manufacturing Co. has commenced work on the last 200 of the 500 box cars which the company is building for the Missouri, Kansas & Texas. The order is being completed at the rate of 20 cars a day.

The Gilbert Car Co., of Troy, N. Y., has leased for an additional term of two years the buildings of the Schenectady Car Co., at Rotterdam, which the company has used for the last three years. Work will commence immediately in these shops on an order recently received for 200 freight cars for a South American road. Between 200 and 300 men will be employed.

The Birmingham Railway Supply Co., which has recently incorporated at Birmingham, Ala., by H. M. Caldwell, W. J. Milner and others, proposes to purchase and enlarge the car works at Gadsden, Ala., and operate them in connection with the new iron foundry and coke works just completed.

The St. Charles Car Co., of St. Charles, Mo., has received an order from the Union Pacific for 12 passenger, four baggage and four mail cars and 15 cabooses. The company has also recently finished and delivered 17 chair cars for the same road. The Missouri Pacific has just placed an order with the company for building 500 box cars.

The saw mill and planing mills of the Ohio Falls Car Works, at Jeffersonville, Ind., were last week totally destroyed by fire, at a loss of $35,000, fully covered by insurance. The fire will not affect the completion of the orders now in hand.

The Ohio Falls Car Co. this week shipped 50 cars of an order of 250 for the East Tennessee, Virginia & Georgia. The company is now busy on an order of 750 for the Louisville & Nashville.

For several years past the large shops located in Albina, near Portland, Or., constructed by the Northern Pacific Terminal Co., have been practically idle. Scarcely any work has been done beyond temporary repairs to engines and cars. Last week the works started up by orders of the company. It is not known whether the shops are to be kept running permanently or not. There are a number of locomotives to be repaired and other rolling stock, and by the time these are completed there may be work enough to keep the big shops going.

Bridge Notes.

Progress is making on the Highland suspension bridge across the Hudson River at Anthony's Nose, below Peekskill, N. Y. Preparation is being made for putting in the anchorages on the east side, and men are at work on the west pier. Fifty men are at work also on the Bull's Head Tunnel, and surveys are in progress on both sides of the Hudson River for the connecting railroads.

Work on the Canada Atlantic bridge, crossing the St. Lawrence River, at Coteau, P. Que., is being pushed forward as rapidly as possible. Placing of the iron work was commenced two weeks ago, and the masonry work will be completed this month.

The Pennsylvania is soon to commence the erection of an iron bridge over Washington street, at Tiffin, O.

It is stated that the Missouri Pacific will commence work immediately on the new viaduct over its tracks at Central avenue, Kansas City, Kan. The bridge will be 1,000 ft. long, including approaches, and the cost is estimated at $35,000. The viaduct proper will be built by the railroad company and the approaches by the town.

Oliver & Bros., of Houston, Tex., have contracted for building a new iron bridge across Rock Ford Creek, in Dallas County, Tex., for $8,000. The contract for building the iron bridge at Commerce street, Dallas, has been let to L. S. Leversedge, of Dallas, for $9,000. Both bridges are being built by the County Commissioners.

A bill has been introduced in the Georgia Legislature to authorize Laurens County, Ga., to build a combination bridge across the Oconee River at Dublin.

New bridges are proposed at the following places: Richmond, Va.; Danbury, Conn.; Keokuk, Ia.; Phœnix, Ariz; Brownsville, Mo.; Kirkwood, Ill., and Watseka, Ill.

The St. Louis Bridge & Iron Co. has recently contracted to construct two bridges at Topeka, Kan., and one at Iola, Kan.; one at Pasen, in Adams County, Ill., and one at Poplar Bluff, Mo., to span the Black River. The aggregate of these contracts is about $25,000.

The Union Pacific will build a new iron bridge over the middle Loup River in the vicinity of Valley, Neb., on the Omaha & Republican Valley Branch, to replace the wooden one now at that point. The new bridge will cost about $5,000.

The Louisville Bridge Co. has let the contract to build new fenders against the piers of the bridge over the Ohio River, at Louisville, to protect them against boats. The improvement will cost $20,000.

The Hartford & Connecticut Western has been granted permission to build a bridge across the Connecticut River, at Springfield, Mass., 900 ft. long and 18 ft. wide. There are to be six spans, each 150 ft. long.

Many changes are being made in the several bridges about Boston, Mass. The iron draw of the bridge over the Neponset River has been lengthened, giving a passage for vessels of 36 ft. instead of 32 ft., as formerly. The City of Quincy has repaired the part of the bridge controlled by it at an expense of $35,000. Other bridges at Boston are also to be widened for the passage of vessels, in accordance with instructions from the Secretary of War.

The City Council, of Topeka, Kan., has passed the ordinance for the construction of the bridge over the Kansas River on Kansas avenue. It is to be a steel truss bridge, with stone piers and abutments, and will cost about $250,000. If the ordinance is approved by a two-thirds vote at a city election to be held Nov. 5, five per cent. bonds are to be issued to pay for its construction.

The City Council of Denver, Col., recently let the contract for building the iron bridge over Cherry Creek, at Larimie street, to the Pittsburgh Bridge Co., for $14,780. The Board of Public Works has refused to approve the award, stating that the bid of the Lane Bridge Co., of Chicago, would be the best to accept, thus supporting the report made by the consulting engineer. It may be necessary to readvertise for bids if the complication is not otherwise settled.

The following bids for the construction of the Lake street bridge at Appleton, Wis., were received: Penn Bridge Co., Beaver Falls, Pa., $6,400; C. P. Jones, $6,400; Smith Bridge Co., Toledo, O., $6,100; Chicago Bridge & Iron Co., Chicago, Ill., $6,082; Clinton Bridge & Iron Co., Clinton, Ia., $5,945; George E. King Bridge Co., Des Moines, Ia., $5,940; Wrought-Iron Bridge Co., Canton, O., $5,875; Pittsburgh Bridge Co., Pittsburgh, Pa., $5,650; King Iron Bridge & Manufacturing Co., Cleveland, O., $5,625; Youngstown Bridge Co., Youngstown, O., $5,620; Milwaukee Bridge & Iron Co., Milwaukee, Wis., $5,477; Wisconsin Bridge & Iron Co., Wauwatosa, Wis., $5,300. The contract was awarded to Wisconsin Bridge & Iron Co.

The South Capitol Street, Anacostia & Giesboro Road & Bridge Association has been incorporated by Andrew K. Brown, P. H. Heiskell, Jr., P. Mann and others, to build a bridge across the eastern branch of the Potomac River at South Capitol street, Washington, D. C.

The following bids for constructing a bridge, iron truss, 100-ft. span, cylinder concrete piers, over the Conasauga River, at Upper Kingsbridge, near Dalton, Ga., were received: Smith Bridge Co., Toledo, O., $1,775; Champion

Bridge Co., $1,800; Southern Bridge Co., Birmingham, Ala., $1,905; Iron Substructure Co., Columbus, O., $2,000; King Bridge Co., Cleveland, O., $2,200.

The Board of Freeholders of Camden, N. J., have decided to build a $40,000 bridge over the canal and the Pennsylvania Railroad on Olden avenue, connecting with Ewing township.

The new iron bridge over the Gowanus Canal, in Carroll street, Brooklyn, N. Y., has just been completed at a cost of $40,000. Instead of the draw swinging on a central pier, the bridge is on the principle of those over the Charles River in Boston, and rolls back diagonally on a tramway on one side of the canal, leaving an open space of 39 ft. for the passage of vessels. A strip of land 90 ft. long and 15 ft. wide is used for withdrawing the bridge. It can be opened and shut in 40 seconds.

The Philadelphia & Reading has awarded a contract to A. & P. Roberts & Co., of the Pencoyd Iron Works, to build a bridge across the Schuylkill River at Reynolds Station, Pa.

Manufacturing and Business.

The Mason Regulator Co., of Boston has brought out a new valve for reducing the pressure from the train pipe to the radiating pipes in car heating.

The Pratt & Whitney Co., of Hartford, Conn., is manufacturing gun machinery for Belgium and Germany. The works are running to the full capacity. The company is just finishing rifling machinery for the Lee gun, the arm adopted for the English army. The orders obtained there will reach about $600,000.

The contract for the large buildings of the Hotchins Nut & Bolt Works, to be erected one mile south of Greensburg, Pa., has been let to the firm of Zahniser & Co. There will be six buildings. The works are expected to be in active operation by Jan. 1. The capacity of the works will be over 125,000 nuts and bolts a day, employing about 250 men.

George A. McArthur, F. W. Thayer and Jas. L. Pennifill have organized the Standard Journal Bearing Co., of Chicago, with a capital stock of $50,000, to manufacture journals and other copper and brass goods.

The Lodge & Davis Machine Tool Co., of Cincinnati, has increased its capital stock from $300,000 to $500,000.

The manufacture and sale of crucible and pneumatic steel, heretofore carried on by Miller, Metcalf & Parkin, of Philadelphia, will be continued by the Crescent Steel Co. There will be no change whatever in management, and the same grade of product will still be furnished.

The Luukenheimer Brass Manufacturing Co., Cincinnati, O., has issued a circular calling attention to its recent extensive improvements for the manufacture of its goods. In addition to the construction of a new four-story brick building, there have been added many new lathes, numerous other tools and special machinery, thus increasing the capacity about 25 per cent.

The Armington & Sims Engine Co., of Providence, R. I., is rapidly pushing toward completion another large addition to its already extensive works, which will give the company an average productive capacity of 150 H. P. per day, perhaps the largest output of any similar concern in this country. The order for machinery of sizes larger than ever before used by it has been placed with Pond Machine Tool Co., Plainfield, N. J., and Nicholson & Waterman, Providence, R. I. Overhead railways, travelers and special tools required will be made from the company's own designs and patterns. Steel rails and turn-tables are furnished by Wm. Wharton, Jr., & Co., Philadelphia.

The Brown Hoisting & Conveying Co., of Cleveland, O., is placing one of its hoists at West Superior, Minn., for the Ohio Coal Co. Also a plant at Fairport, O.; this will be used for handling ores on the Pennsylvania and Lake Erie docks. A plant has been put up at Piedmont on the Hudson for the Lake Erie & Western; this plant will be used in handling coal. All these plants are similar to those in operation on the New York, Pennsylvania & Ohio docks at Cleveland. The firm is also building a cantilever derrick for Jones & Laughlin, Pittsburgh; length of booms 306 ft.

The Gould-Tisdale Revolving Semaphore Co., of Boston, is erecting four of its revolving semaphores at Sylvan Junction, N. Y., on the Elmira, Cortland & Northern road, and also two of the same pattern on the Delaware, Lackawanna & Western at Utica, N. Y. This signal was exhibited, full size, on the piazza and in the yard of Congress Hall, at Saratoga, in June last. It is already in use on the Delaware & Hudson at Fort Edward, N. Y., on the West Shore at Kingston and Fort Montgomery, N. Y., and on the Western New York & Pennsylvania at Buffalo.

The highest award for insulated wires and cables at the Paris Exhibition, a gold medal, has been given to the Okonite Co., of New York. The exhibit of okonite specialties includes a full line of Candee aërial wires and Manson and Okonite tapes. The wiring of the American Bell Telephone Co.'s exhibit, and also that of the Western Electric Co. at the Exhibition, was done with okonite wire.

The Laidlaw & Dunn Co., of Cincinnati, O., has sold another 300 H. P. Galloway boiler to the Geo. H. Friend Paper Co., West Carrollton, O. This makes three of this size sold to this concern within a year.

Moffett, Hodgkins & Clarke, engineers and contractors, will remove their principal offices from Watertown to Syracuse, N. Y., Oct. 10, where correspondence relating to the general business of the firm should be addressed. The branch offices at New York and Chicago will be conducted as heretofore.

Iron and Steel.

Riter & Conley, of Pittsburgh, Pa., have just completed for the Philadelphia Gas Co. a mile of 36-in. wrought pipe made of steel plate riveted. Under a pressure of 75 lbs. there was no appreciable leak in it.

The Carbon Iron Co., of Pittsburgh, will shortly break ground for two additional open-hearth furnaces, which will double its steel producing capacity. The company has recently turned out some big work in the shape of eye-bars for the Merchants' Bridge at St. Louis. These bars are 8½ by 2¾ in. and 62 ft. 8 in. long, weighing over two tons apiece. They are claimed to be the largest eye-bars ever put in a bridge.

The Macungie Iron Company, at Allentown, Pa., has decided to put its furnace in blast as soon as the necessary repairs can be made, which will require about three weeks.

The Montgomery Iron Co.'s furnace, in Montgomery County, Pa., is now out of blast, and it is proposed to improve the product and make Bessemer pig iron.

The Washington Navy Yard has just received and will put up within four weeks a band saw for cutting sheet steel 2 in. thick. The tool was made by Greenwood & Batley, of Leeds, England, and cost $16,000.

The Fort Payne Rolling Mill Co., recently organized to build a rolling mill at Fort Payne, Ala., has increased its capital stock from $300,000 to $500,000, all subscribed for. Work will soon be commenced.

The Reliance Steel Casting Co., of Pittsburgh, made its first cast about a week since, which was very successful, and it is now running steadily with a number of orders. The company makes a specialty of light and medium weight steel castings.

The Center Iron Co.'s furnace, at Bellefonte, Pa., is being relined and remodeled in accordance with designs furnished by Frank C. Roberts, C. E., of Philadelphia.

Samuel W. Hay, with office in the Hamilton Building, Pittsburgh, has been appointed agent in that city for the Solid Steel Co., of Alliance, O., manufacturers of steel castings.

The Minerva Furnace, at Milwaukee, has been leased to Forsyth, Hyde & Co., of Chicago, and others, who will organize the Minerva Furnace Co., to operate the furnace. The capacity of the furnace is about 70 tons per day.

It is reported that Cooper, Hewitt & Co. contemplate the erection at Trenton, N. J., of three large open-hearth furnaces to use the basic process.

The Shenandoah Iron Co., which recently purchased the Gem iron furnace at Milnes, Va., has repaired it and will shortly put it in blast.

The Phœnix Furnace & Land Co. proposes to build immediately an iron furnace at New Birmingham, Tex., to have a capacity of 50 tons daily. It will cost about $100,000.

The Rail Market.

Steel Rails.—The quotation in the East is $29 at works, and this price is well maintained, the market continuing very firm. One trunk line has purchased 5,000 tons at $29 at works, Scranton, Pa., with the option of taking a further 5,000 tons at the same price. A Southern order for 8,000 tons has been placed at $29 at Eastern mill and another for a similar quantity, winter delivery, on special conditions. Besides these there have been sales of 6,000 tons, private terms, and 2,000 tons to the New York, New Haven & Hartford at $29. The mills report many inquiries for 1890 delivery. The Chicago mills will be busy on present orders till late in November or to December. Quotations are $33 for standard sections and $36@$37 for 35 and 40-lb. rails. Pittsburgh quotes $32 with the mills all busy.

Old Rails.—A lot of 800 tons has been offered in New York at $24.50 on cars at Jersey City, and another lot of heavy sections has been offered at $25 on cars. Both lots are unsold, the best bids being $24 on cars. In Chicago sales of iron rails have been made at $24.75@$25, and old steel rails are quoted at $17@$19. In Pittsburgh a sale of 500 tons has been made at $26.35, but quotations are generally $27@$28.

Awards at the Paris Exposition.

Among the awards made at the Paris Exposition to Americans are the following:

Rensselaer Polytechnic Institute, Troy, grand prize.
Massachusetts Institute of Technology, Boston, gold medal.
New York Bank Note Company, medal.
United States Geological Survey, grand prize.
Darling, Brown & Sharpe, Providence, R. I., gold medal.
Herman Hollerith, Washington, gold medal.
United States Signal Service, grand prize.
United States Coast and Geodetic Survey, grand prize.
United States Army, Corps of Engineers, grand prize.
J. A. Fay & Co., Cincinnati, wood-working machines, grand prize.
Pennsylvania Railroad Company, grand prize.
Cobb Vulcanite Wire Company, grand prize.
Elihu Thomson, Lynn, Mass., electrical appliances, grand prize.
Western Electric Company, Chicago, gold medal.
Sprague Tramway Company, gold medal.
Yale & Towne Manufacturing Company, gold medal.

The Teredo on the Pacific Coast.

It is stated that the Seattle, Lake Shore & Eastern road is subjected to constant trouble and expense from the rapid destruction of the piling at Seattle by the teredo. The piles last but from 6 to 18 months.

St. Louis Elevated Railroad.

It is stated that arrangements have been concluded to secure $6,000,000 capital for the construction of the elevated railroad in St. Louis. The money will be raised through Ladenburg, Thalhiman & Co., and will come from Holland capitalists. The drawings for the road are said to be in an advanced state of preparation. There will be seven miles of elevated structure. It has not been decided yet what motive power will be used.

Notes from the Pittsburgh Locomotive Works.

The Pittsburgh Locomotive Works are busy both with new work and with the erection of new buildings. The new boiler shop has the walls partly up, and the main posts, which are to carry the traveling cranes, in position. The machinery in the machine shop is being shifted to make room for the walls of the new shop which is to be built around the other while the machinery now in use is still in operation. The work on the boiler shop has been delayed by the contractors. This structure will be one story with a monitor roof 11 ft. above the main roof. The floor area—275 ft. × 120 ft.—is large enough to do all the work in one building, and the tools will be arranged so as to keep the work in rotation from one end of the shop to the other. In the side bays the tools will be arranged, and over the centre will be placed a 20-ton Sellers' traveling crane moving on rails mounted on wrought-iron columns made of Z-iron, which also serve to support the roof. In one end will be located the hydraulic riveting machinery, consisting of one 6 ft. and one 10 ft. 6 in. hydraulic riveters, and the pumps and accumulators. At the opposite end will be located a hydraulic flanging machine 8 ft. × 8 ft., suitable for all classes of locomotive boiler work. A new pair of rolls is to be especially built, which are of steel, 18 in. diameter and 12 ft. long, with an end opening to remove whole cylinders without spreading. All of the tools will be set on a concrete bed made of broken stone and cement. The new machine shop will be 356 ft. × 125 ft., arranged in two stories, with a clear space in the centre for a traveling crane. The small tools will be located on the second floor, and the whole tool arrangement altered to suit the demand for large locomotives at reduced rates, which seems to be the tendency at present. The new office building will be 125 ft. × 30 ft., three stories in height, of brick and fireproof. On the lower floor will be located the general offices. On the second floor will be the drawing-room, with a tile vault for all drawings. In the third story will be the blue print apparatus, a general storage and room to expand into when the lower floors are crowded.

The officers have devoted much time and personal labor to these improvements, and many plans have been made and discarded. The ground available is small, and it has been a difficult problem to so distribute the buildings as to obtain the largest working capacity in a limited area of a given shape. The tools now in use in these works are modern and some of them, such as the frame drills, milling machines, wheel borers, etc., are these best of their kind. Many of these are special tools, made from the drawings of the company. When the new shops are done, and the new tools now contracted for are in position, these works will be among the best fitted for locomotive construction of any in the United States. The foundry, built several years since, is one of the best paying buildings in the place. It turns out about 26 tons of castings daily, about eight tons of which are for locomotive work. It will be remembered by those who have visited this portion of the manufactory that the design, owing to the limited area available, differs from all other shops for the purpose in several particulars. This shop was considered by some to be an experiment of doubtful efficiency, but the proof of actual trial has shown that the design is a good one, and the sand pits, core ovens, molding machines and cranes are admirably adapted to the class of work demanded. It is the evident intention here to purchase the best class of tools, and use them to their utmost with the usual result—economical production.

Pneumatic Block Signals on the Jersey Central.

A contract has been made by the Central Railroad of New Jersey with the Union Switch & Signal Co. to put in the pneumatic block system between Jersey City and Bergen Point. The work is now progressing, and it is hoped that the system may be in use by the middle of December.

Canadian Canals.

Messrs. Simms & Hutchinson, of Ottawa, have been awarded the contract for deepening and widening Section 8, of the Cornwall Canal. The Dominion Parliament last session voted $1,200,000 toward deepening and enlarging this canal to a 14½ ft. draught on the mitre sills. The government, it is understood, will shortly call for tenders for deepening and enlarging the Beauharnois Canal. The Dominion Parliament last session voted $4,589,740 for canal improvement, for a large amount of which work tenders have yet to be received. The expenditure is to be distributed as follows: Sault Ste. Marie Canal, $1,291,400; Lachine, $79,000; Cornwall, $1,200,000; Williamsburg, $800,000; St. Lawrence River canals, $620,000; Murray Canal, $217,000; Welland, $212,000; Trent River navigation, $80,000; St. Anne Canal, $44,640; Grenvelle, $7,000; Tay Canal, $25,000, and the Calbute, $13,000. That traffic might not be interrupted during the season of navigation, a large proportion of the work has been delayed until the winter months.

Interlocking.

In a paragraph on interlocking, which appeared last week in this department of the *Railroad Gazette*, the omission of a heading caused the interlocking work done and doing on the Lehigh Valley road to appear under the Old Colony. The paragraph was as follows: This company has now in service three interlocking towers, namely, South Plainfield, 12 levers; Mahoning, 6 levers; Packerton, 7 levers. At the Pattenburg tunnel a machine of 6 levers, not interlocked, is being put up. At Mahoning the Palmer torpedo is being put in in place of derailing switches. The company has plans out for bids for interlocking at Dismal Gap, Allentown and Delano.

The Long Island has put in interlocking switches at the Hempstead and Mineola junction.

Westinghouse Air Brake Instruction Car.

When we last heard from this car it was in Texas, on its way West. It will go to the Pacific coast, over various lines, finally reaching Portland, Or. This car is fitted with cylinders and piping representing a 30-car train; also with air signal apparatus for a 15-car train, and with a dynamo for electric lighting and engine for compressing air. Frequent stops are made for the purpose of giving instructions to railroad men.

The New Orleans Bridge.

Mr. T. C. Clarke has submitted to Mr. Henry Shaw, of the New Orleans Terminal Railway and Bridge Co., a plan for a draw-bridge across the Mississippi at that city. His plan contemplates two swing spans each 500 ft. over all, meeting in the centre. When both are open there will be a centre opening of 464 ft. in the clear, and two side openings of 224 ft. each. He suggests that the precise location of the bridge be fixed by the United States engineers so as to offer the least impediment to navigation, and says that any captain who cannot take the largest ocean ship through a 464 ft. opening on a straight reach of the river just below the city, would deserve to be degraded to the rank of a cabin steward, and probably then he could not get a tureen of soup through it without spilling it. He has no doubt as to the practicability of foundations in that part of the river, and thinks that two years would be sufficient time in which to build the bridge. His plan provides for a double track bridge with two sidewalks, or with one sidewalk and one electric street car track.

Bridge Accident.

The bridge which fell recently on the Evansville & Terre Haute Railroad, at Patoka, causing a wreck of a freight train, was a combination bridge built by a St. Louis firm. The immediate cause of the fall of the bridge is not known, but it is supposed to have been due to a defective hanger.

New 10-Wheelers for the Canadian Pacific.

Under the direction of Mechanical Superintendent Atkinson, the Canadian Pacific is having 12 locomotives constructed in its own shops, of a new design, having ten wheels and calculated to haul 30 loaded cars each. They are intended also for higher speed than the moguls in use on that road. Two of these new pattern engines have been running on the road since last spring.

THE SCRAP HEAP.

Notes.

A collision in a tunnel, between Foggia and Naples, Italy, Sept. 30, killed three and injured 27. The accident was caused by the negligence of a signalman.

The Canada Pacific week before last contracted to deliver $36,000 worth of seal skins from Victoria, British Columbia, at Montreal in seven days, and in eleven days more to lay them down in London.

Articles of incorporation of the Sioux City Terminal Railroad & Depot Co. have been filed. The incorporators are: A. S. Garetson, T. P. Gere and D. E. Paulin, and the capital stock is $1,000,000, of which $200,000 is paid up.

The Puget Sound & Alaska Steamship Co. has recently been incorporated, at Olympia, W. T., with a capital stock of $600,000, for the purpose of placing a line of steamers on the route between Puget Sound, Victoria, B. C., and Alaska.

A train ran off the track near Wild Park station, Germany, Tuesday, and rolled over an embankment. Three carriages crowded with passengers were smashed into fragments, and seven persons were killed and 43 severely injured.

The immigrant arrivals at the ports of the United States in August numbered only 31,418, against 35,817 in the same month of last year. In the eight months to Aug. 31 the ar-

rivals numbered 300,564, against 392,942 in 1888, a decrease of 92,378, or 23 per cent.

It appears that the new palace car "Ottawa," recently constructed at the Coburg Car Works for the Dominion government, did not come up to the expectations of the government Engineer-in-Chief, who has just turned her out of the Intercolonial car-shops at Moncton, after adding several thousand dollars to the original cost of construction.

The Metropolitan Railway of London has offered to the manager of the "slide railroad" exhibited at the Paris Exposition and described in the *Railroad Gazette* of Aug. 9, page 531, a piece of ground for laying an experimental line of two miles in length. Sir Douglas Galton has read a paper before the British Association on this invention.

The Governor of Michigan has surrendered to the United States about 22,000 acres of land in the upper peninsula which had been granted for railroads from Ontonagon to the Wisconsin state line, and from Marquette to Ontonagon. Many homesteads have been taken on these lands. The railroads will probably contest the case in the courts.

The Kansas Railroad Commissioners, in considering the application of the citizens of Ten-mile Township, Miami County, for station facilities on the Missouri Pacific, take occasion to condemn in strong language the practice of officers of construction companies in hawking stations about the country, selling them to the highest bidder, which was the cause of the lack of facilities in this case.

The Pennsylvania has introduced the phonoplex system of telegraphing into several of its large offices. The system is used on a wire between Jersey City and Philadelphia, and on another between Harrisburg and Pittsburgh. It is also in use on the New York, New Haven & Hartford. With this apparatus, pulsatory currents, as employed in telephone transmission, are used by one sender, and Morse instruments by the other.

The new "Southwestern Limited" of the New York Central will be put in service Oct. 6. It will leave New York every day at 8:50 a. m., an hour ahead of the Chicago limited. The train will consist of a combination library, smoking and café car, a regular smoking car, standard day coach, drawing-room car, sleeping car for St. Louis, sleeping car for Cincinnati and a dining car, all of the latest designs and vestibuled throughout. No extra fare is to be charged.

The engineers, as an organization, have kept out of the proposed plan of federation of all railroad [employés'] orders; but in many localities all the orders are signing articles of confederation for the system of road or the particular locality. The latest instance reported by the daily press is that of the employés of the Union Pacific system. The federated firemen, brakemen and switchmen have recently won some decided victories, and kept still about it—a grand improvement in itself. If federation properly governed it would be a good thing—the principle is all right.—*Locomotive Engineer.*

The Governor of Iowa is encountering some difficulty in getting replies from the railroad companies to the questions put to them under his direction by the Railroad Commissioners recently concerning the names of stockholders and of attorneys, the compensation of the latter and of other officers and employés, and the number of mileage tickets issued for other than cash consideration. The daily papers have printed extended news items about the matter, but it appears the difficulties so far are only with the minor companies, the larger roads not having yet filed their reports.

Launch of a Steam Tender.

The Jonson Foundry & Machine Co., whose shops are in East 118th street, New York, on Saturday last launched the iron steam tender "Argus," which they have been building for the United States government, for the use of the Surveyor of the Port of New York. She is said to be the first iron vessel ever built in the corporate limits of the city of New York. The length of the boat is 85 ft.; beam, 15 ft. 9 in.; depth, 9 ft.; and displacement, 92 tons. She has a triple compound engine.

A Canal Across Michigan.

Grand Rapids and Holland (Mich.), business men are proposing to run a canal from the former city to Holland and Lake Michigan at a probable cost of $2,000,000. The Holland route is the shortest and easiest for Grand Rapids to connect with Lake Michigan. A committee composed of members of the Board of Trade and other citizens of Grand Rapids and Holland will investigate the route.

Train Wrecking.

An attempt was made to wreck the northbound way freight about a mile south of Manchester, N. H., on Saturday afternoon, by placing a large piece of iron in a switch on a sharp curve. The engineer of the freight train saw the obstruction and stopped the train.

An attempt to wreck a train full of passengers was made Oct. 1 on the Pine Bluff branch of the Iron Mountain Railway, at Sappington's switch, which is on a bank 70 ft. high. The train was making good time when the engine suddenly struck an obstruction, but fortunately did not leave the track. It was discovered that some one had wedged a piece of railroad iron between the guard rail and main rail, and had spiked two brake shoes into the frog.

The Conemaugh.

The work of clearing up the bed of the Conamaugh River is rapidly progressing, yet large piles of débris still remain, and among it can be seen, here and there, the remains of freight cars and railroad equipment. In most cases the wood work has been burned, the iron work only remaining. The new bridges over the river, on the Pennsylvania Railroad, are being pushed to completion with great rapidity.

The Providence Terminals.

The joint special committee on terminal facilities has reported to the city council recommending the plan recently proposed by the railroad companies, and the committee was authorized to enter into an agreement with the railroad companies regarding transfer of land, etc. The plan contemplates the construction of an elevated station upon the filled-in cove just north of the present station.

Mr. Dorsey on American and English Railroads.

At the Newcastle meeting of the British Association, Mr. Dorsey, the author of "English and American Railways Compared," read a paper entitled "The Comparative Cost of Working English and American Railways," in which he exhibited tables comparing the operating expenses in 1888 on the London & Northwestern, Great Northern and other English lines with those on the Pennsylvania Railroad and the Knoxville branch of the Louisville & Nashville, and showed that on the English roads, which have cost from four to six times more to construct than the American roads, the cost for transporting freight is more than double the cost on American roads; whereas it should be less. Mr. Dorsey's efforts to champion the abnormally high cost of railroad transportation in England are not understood to be received with enthusiasm by those more directly interested in the transportation problem. They are not over crying for "more missionary," but, as the *Railroad Gazette* has remarked, an investigation of the causes of this great disparity in the costs of service in the two countries by persons conversant with the details of railroad management in both could not fail to be of service not only to England, but to those countries which, buying both professional services and rolling stock, might hesitate before adopting the costly English methods and appliances.

The Pennsylvania Railroad in Camden.

The Camden City Council has passed an ordinance granting the Pennsylvania Railroad Co. permission to carry the street grades over its tracks at Second street and Bridge avenue.

Tarpaulins in English Freight Service.

All of our readers know that it is the general custom in England to carry freight on open cars, "trucks," goods that may be injured by the weather being covered with tarpaulins. Probably it has occurred to many of them that these tarpaulins are very liable to get lost, especially when cars go off their own lines. Mr. Ackworth, in his recent book, "The Railways of England," explains the means taken to prevent this. In the first place all tarpaulins, or sheets, as they are called, have a distinctive mark, and bear the initials of the company and are numbered. They are painted black. Those of the Midland have a broad edge of yellow, those of the Northwestern have two red lines, those of the Great Northern have white and blue lines running across them diagonally, etc. The numbers are all recorded. At junction points records are made of all sheets passing from one line to another, and these are reported every day to the Clearing House in London. If, after a proper interval, each sheet is not reported to the Clearing House as returned to its owner a demurrage charge is made against the road retaining it.

Fees of State Railroad Commissioners.

The law passed by the Ohio Legislature last winter, requiring each railroad company to pay to the Railroad Commissioner an annual fee of $1 per mile for its trackage within the state, is to be tested. The Pennsylvania system refuses to pay the fee, which in its case amounts to $1,400, the largest sum for any system in the state. The Lake Shore comes second on the list at $839, and the aggregate sum to be paid to the state will reach about $8,000 per year. All the roads except the Pennsylvania have settled with the State Railroad Commissioner.

The Burned Cascade Bridge and Snowsheds.

Some very effective work was done by the various departments of the Central Pacific in bridging over the break in the line caused by the fires in the Sierras. Word was received Thursday afternoon that the bridge was burned. That night 49 carloads of timber and miscellaneous material, necessary for replacing the bridge, were started for the scene. A quantity of the material went from Oakland and the rest from Sacramento. With the construction train went Superintendent of Track Curtis, J. D. Isaac, Arthur Brown's chief assistant, Master Car Builder Ben Welch, of Sacramento, and about 500 men, who were taken, most of them, at very short notice, from the Sacramento shops. It was also necessary to send along a train equipped as an eating house. Friday morning the work of reconstruction began, and on Tuesday trains were crossing the new bridge. The burned snowsheds will not be rebuilt, as it is thought the rotary snowplows can keep the track clear.

Wages on the Elevated Road.

A New York paper publishes the following list of the rates of pay on the Manhattan (elevated) road in New York City.

Rates of Pay.

(All employés are paid by the hour.)

	Cents.		Cents.
Engineers:		Platform men:	
At appointment	33.3	At appointment	10.4
End of six months	36.1	End of six months	12.5
One year and after	38.8	One year and after	13.8
Firemen:		Gatemen:	
At appointment	17.7	First year	10.4
End of six months	19.4	Second year	12.5
One year and after	22.2	Agents and operators:	
Conductors:		At appointment	14.5
First year	20.0	End of six months	16.7
Second year	22.0	One year and after	18.8
Third year	23.0	Station agents:	
Guards:		First year	14.5
First year	15.0	Second year	16.7
Second year	16.5		
Third year	17.5		
Fourth year and after	18.5		

The station agents and operators, the platform men and the gatemen work 12 hours a day without intermission, though it appears there is a state law prohibiting such a practice without a half hour for a meal.

The Tribulations of a Reformer.

The paragraph which follows is quoted literally from the columns of a Western journal, which is trying to reform the railroad vocabulary. The editor has proposed "locomotor," as a substitute for "engineer," as the designation for the man who runs a locomotive, and he uses the word religiously in his own columns. Unfortunately in his ignorance of railroad matters he gets tangled up in his terms and his reform languishes. It is barely possible that he has concluded to extend the new name to maintenance of way engineers who sometimes pump hand cars.

"Vice-president and General Manager Clark, of the Missouri Pacific, has issued a circular announcing that, after Oct. 1, all assistant engineers [locomotors] who have heretofore acted under the exclusive jurisdiction of general and division superintendents will report to and receive instructions from Chief Engineer Way. Assistant engineers will furnish information and perform services required by general and division superintendents, but will report all such work to the chief engineer."

Lake Superior Iron Ore Shipments

The shipments of Lake Superior ore still continue at an unprecedented rate, and were up to the 25th ult. 2,163,498 tons in excess of the shipments of last year to the same date, as shown by the following table, giving shipments to that date for the last four years:

Range.	1886. Tons.	1887. Tons.	1888. Tons.	1889. Tons.
Marquette	1,157,264	1,250,552	1,246,778	1,915,000
Menominee	649,053	863,266	750,341	1,275,000
Gogebic	513,831	883,019	910,413	1,450,000
Vermillion	234,874	285,640	253,965	685,000
Totals	2,560,022	3,337,477	3,161,502	5,325,000

This seems to leave no doubt that the total shipments for this year will exceed 7,000,000 tons. An apparently careful estimate in the *American Manufacturer* puts the account at 7¼ million tons, including 100,000 tons shipped by rail before the commencement of navigation, and 50,000 tons which it is assumed will be shipped after the close of navigation. Others are estimating on 7½ million tons, and all of the shipments seem to be well sold up. The *Iron Trade Review*, of Cleveland, after an exhaustive canvass of the local market, says that rather less than 5 per cent. of the ore is unsold and much of this is in remnants and inaccessible lots. So that practically all is sold, and in some instances the output has been oversold. A noticeable feature of this year's production is the increase in the proportion shipped to Western works, which have this year taken about 30 per cent. more than last. There has also been an increase in the shipments to tide water where Lake Superior ore is competing with Cuban and European ores.

The tendency to make iron in the West seems to be increasing. The works at Ashland are said to be making money and the coke ovens at West Superior, built by the Lehigh company a year ago to utilize slack, have proved so profitable that they propose to add 100 more as soon as possible, coking their coal there instead of bringing coke by railroad. Some of the Gogebic mines are already shipping ore by rail to Chicago and Milwaukee, finding it a few cents per ton cheaper than to ship to Ashland or Escanaba by rail and then transfer to vessels. Last winter some ore was shipped by the Negaunee mines as far east as the Mahoning Valley, but the freight charges were too high for a large business. A reduction of rates would probably be rewarded with a large traffic. It is only a short time since the British Iron and Steel Institute were told by their president that in the near future we would have to rely on Cuban and European ores for our Bessemer and open-hearth steels. In 1887 the Lake Superior mines produced 4,738,903 tons, and 5,023,279 tons in 1888. It is understood that they can produce 10,000,000 tons in 1890 if proper inducements are offered.

Wine for the Railroad Congress.

The Railroad Congress at Paris having concluded its deliberations, launched out on a sea of champagne and champagne-inspired speeches on Tuesday evening. The way in which the wine for the banquet at the Palais de l'Industrie was supplied was somewhat curious. The champagne was provided by the Eastern Railway Company, while the Paris & Lyons Company supplied all the Burgundy, and the Orleans Railway the Bordeaux, and other luxuries were sent by the leading railways of Europe. It is not within our information, however, that the Southeastern Railway Company furnished a time-table by means of which the English delegates could reach London punctually. Such a luxury as that has still to be evolved from the inner consciousness of Sir Edward Watkin.—*Financial Times.*

Uniform Time in Germany.

Among other projects for the convenience of railroad travelers in Germany, the question of the advisability of conforming to our practice of standard time is claiming the attention of the government railroad circles. The South German states already possess standard time. That of Bavaria is reckoned from Munich, of Wurtemberg from Stuttgart, and that of Baden from Karlsruhe. In the rest of Germany the time tables for public use give the local time, while those for official use are mostly based on Berlin time; a state of affairs which is said to be prejudicial to the security of the trains and attended with much inconvenience to the traveling public.

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

In New York the fiscal agent of a railroad company negotiated a loan from the defendant to be secured by a mortgage on the corporate property. Pending the execution of the mortgage, certain certificates of stock in a coal company, issued in the names of plaintiffs, and which plaintiffs claimed to own, were delivered to defendant as temporary security with the consent of plaintiffs. A power of attorney executed in blank was indorsed on each certificate. Afterward the stock certificates were handed back to the agent of the railroad company, on the delivery to defendant of the mortgage. Thereafter, the stockholders of the railroad company having refused to ratify the mortgage, defendant caused it to be canceled, at the request of the railroad company, and obtained from the agent a return of the stock certificates. In the meantime the railroad company had passed a resolution to the effect that it was not the owner of the certificates, and that they should be delivered to the president of the coal company. But the resolution did not state who the owners of the stock were, and it did not appear that the defendant had any notice that the shares were claimed by plaintiffs. The Supreme Court holds that defendant was entitled to recover possession of the certificates.[1]

The Supreme Court of Alabama holds that the repeal of a statute, which gave to railroad companies the power to acquire and hold lands granted to aid in the construction of the roads, could not take away the vested right to acquire and hold such property, which existed in companies organized under the act before its repeal.[2]

In California the Supreme Court rules that the provisions of the state Constitution providing for a railroad commission having power to establish rates of charges for "railroad and other transportation companies," and imposing penalties on any "railroad corporation or transportation company" refusing to conform to the regulations of such commission, applies to all persons engaged in transportation, whether as corporations or individuals.[3]

The Supreme Court of Georgia holds that the statute of 1885, making it a criminal offense to wreck railroad trains, applies to all railroads, whether chartered or not.[4]

Carriage of Goods and Injuries to Property.

In Indiana the Supreme Court decides that a clause in a bill of lading, limiting to a certain amount the liability of a carrier in case of loss of goods shipped, does not control, where there is evidence of negligence on the part of the carrier, and no evidence that a lower rate of freight was given on account of such limitation.[5]

In Pennsylvania, a clause in a bill of lading provided that the consignee or owner should pay the freight at the time of the delivery of the goods to the consignee, and that the goods might be retained by the carrier for charges due thereon, and also on any other goods for the consignee or owner. The Supreme Court holds that the carrier had no right, as against a vendor, who has exercised his right of stoppage *in transitu*, to retain the goods until arrearages due by the consignee on preceding shipments had been paid.[6]

The Court of Appeals of Kentucky holds that where goods shipped over the line of a railroad have actually arrived at their destination, and the consignee, having been notified of their arrival, makes demand for them, the refusal of the carrier to deliver them, although on the ground that it has not got them, constitutes a conversion.[7]

The Supreme Court of Georgia rules that it is not negligence for a locomotive engineer to blow the stock-alarm whistle in a town or city to frighten an animal from the track in case of a sudden emergency, more especially where the scene of the occurrence, though within the corporate limits, is not in a populous quarter, but in the woods or fields adjacent to the city proper.[8]

In Mississippi the Federal Court holds that where damages are assessed against a railroad for taking a right of way only

such damages as will naturally and reasonably flow from a lawful use of the right of way can be taken into account by the commissioners called to make the assessment; and if, after the assessment is made, and the company takes possession, they make an unlawful use of the right of way, and damages flow therefrom, the owner is entitled to additional damages; such additional damages not having been included in the original assessment. Therefore, a railroad is liable to the owner of real estate, situated in an incorporated city or town, for damage and injury done to his house and buildings by vibrations of the soil, where it can be shown that such damage and injury is the direct result of traveling at a greater rate of speed than six miles per hour, prohibited by statute.[9]

In Iowa the Supreme Court rules that an instruction as to damages that mere inconveniences resulting from the location of the railroad are not of themselves to be considered, "but you are to consider them for their bearing, and only for their bearing, on the market price of the farm to which such inconveniences are attached," the necessity of frequently opening gates and crossing the railroad, and the danger of fire being referred to as instances, is correct.[10]

In New York the Supreme Court rules that where it appears that the engine dropped coals of fire as large as a butternut on a portion of the track where there was combustible material, and in a dry and windy time, from which the fire started, a verdict for plaintiff will not be set aside, though the engine was properly constructed, and in good order, as negligence in its management may be inferred from the circumstance of dropping coals of that size.[11]

[1] Wing v. Holland Trust Co., 5 N. Y. Supp., 384.
[2] Geo. Pac. R. Co. v. Wilks, 6 South. Rep., 34.
[3] Moran v. Ross, 21 Pac. Rep., 547.
[4] Hodge v. State, 9 S. E. Rep., 676.
[5] Adams Ex. Co. v. Harris, 21 N. E. Rep., 340.
[6] Penn. R. Co. v. Am. Oil Works, 17 Atl. Rep., 671.
[7] L. & N. R. Co. v. Lawson, 11 S. W. Rep., 510.
[8] Port Royal & R. Co. v. Phinizy, 9 S. E. Rep., 609.
[9] Porterfield v. Bond, 38 Fed. Rep., 391.
[10] Dudley v. M. & N. W. R. Co., 42 N. W. Rep., 359.
[11] Coolidge v. R., W. & O. R. Co., 5 N. Y. Supp., 301; Douglass v. R., W. & O. R. Co., 5 N. Y. Supp., 214.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chartiers, 2½ per cent., payable Oct. 1.

Chicago, Rock Island & Pacific, quarterly, 1 per cent, payable Nov. 1.

Delaware, Lackawanna & Western, quarterly, 1¾ per cent., payable Oct. 21.

Norfolk & Western, 1½ per cent., on the preferred stock, payable Oct. 24.

Pittsburgh, Ft. Wayne & Chicago, special quarterly, 1¾ per cent., payable Oct. 1, and the guaranteed quarterly 1¾ per cent., payable Oct. 8.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Cleveland, Cincinnati, Chicago & St. Louis, annual, Cincinnati, Oct. 30.

Evansville & Terre Haute, annual, Evansville, Ind., Oct. 21.

Great Northwest Central, special, Ottawa, Oct. 21, to consider a proposed issue of bonds.

Lake Erie Essex & Detroit River, special, Windsor, Ont., Oct. 29, to consider a proposed mortgage.

Knoxville Belt, special meeting at Knoxville, Tenn., Nov. 2, for the purpose of acting upon a proposed mortgage.

Louisville, New Orleans & Texas, annual, 39 South Court street, Memphis, Tenn., Oct. 7, at 11 a. m.

Northern Pacific, annual meeting of stockholders and special meeting of the preferred stockholders, Oct. 17. Transfer-books close Sept. 16, and remain closed until Oct. 18.

Ohio & Mississippi, annual, at Cincinnati, O., Oct. 10, 10 a. m.

Oregon & Transcontinental Co., special meeting, Portland, Or., Nov. 5, to take action on the question, which has already been submitted to the directors, whether the capital of the company shall be reduced or the company shall be liquidated and go out of existence.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *General Time Convention* holds its fall meeting at Hotel Brunswick, New York City, Oct. 9, at 11 a. m.

The *Association of North American Railroad Superintendents* will hold its eighteenth annual meeting at the Hotel Brunswick, New York City, Oct 7.

The *International Brotherhood of Locomotive Engineers* will hold its twenty-sixth annual convention at Denver, Colo., Oct. 16.

The *National Association of Railway Station Agents* will hold its annual convention at Kansas City, Mo., Oct. 23.

The *New England Railroad Club* meets at its rooms in the United States Hotel, Beach street, Boston, on the second Wednesday of each month, except June, July and August.

The *Western Railway Club* holds regular meetings on the third Tuesday in each month, except June, July and August, at its rooms in the Phenix Building, Jackson street, Chicago, at 2 p. m.

The *New York Railroad Club* meets at its rooms, 113 Liberty street, New York City, at 7:30 p.m., on the third Thursday in each month.

The *Central Railway Club* meets at the Tifft House, Buffalo, the fourth Wednesday of January, March, May, August and October.

The *American Society of Civil Engineers* holds its regular meeting on the first and third Wednesday in each month at the House of the Society, 127 East Twenty-third street, New York.

The *Boston Society of Civil Engineers* holds its regular meetings at its rooms in the Boston & Albany station, Boston, at 7:30 p. m., on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 67 Washington street, Chicago, at 7:30 p. m., on the first Tuesday in each month

The *Engineers' Club of St. Louis* holds regular meetings in St. Louis on the first and third Wednesdays in each month.

The *Engineers' Club of Philadelphia* holds regular meetings at the house of the Club, 1,122 Gerard street, Philadelphia.

The *Engineers' Society of Western Pennsylvania* holds regular meetings on the third Tuesday in each month, at 7:30 p.m., at its rooms in the Penn Building, Pittsburgh, Pa.

The *Engineers' Club of Cincinnati* holds its regular meetings at the Club rooms, No. 24 West Fourth street, Cincinnati, at 8 p. m., on the fourth Thursday of each month.

The *Engineers' Club of Kansas City* meets at Kansas City, Mo., on the first Monday in each month.

The *Civil Engineers' Society of St. Paul* meets at St. Paul, Minn., on the first Monday in each month.

The *Montana Society of Civil Engineers* meets at Helena, Mont., at 7:30 p. m., on the third Saturday in each month.

The *Civil Engineers' Club of Kansas* holds regular meetings on the first Wednesday in each month at Wichita, Kan.

Boston Society of Civil Engineers.

A regular meeting was held at the Massachusetts Institute of Technology, Sept. 18, President Fitz Gerald in the chair, 38 members and 22 visitors present. Mr. George L. R. French was elected a member of the society. The government was authorized to appoint a committee of three to confer with the committee of the American Society of Civil Engineers on the proposed revision of the constitution of that organization. The committee was subsequently appointed as follows: Frederick Brooks, Dwight Porter and Sydney Smith.

Mr. George A. Cambell read a memoir of William S. Barber.

A resolution was adopted expressing the thanks of the Society to the Boston & Albany Railroad for its kindness and generosity in permitting the society to occupy rooms in its Boston station for the past four years.

Mr. Edward Sawyer read a paper entitled Mills and Mill Engineering, which was well discussed, Mr. Edward Atkinson, Mr. C. J. H. Woodbury and various mill superintendents and experts taking part in the discussion. President Fitz Gerald discussed the matter of heavy floors of wood in their relation to fireproof construction, illustrated by reference to a recent fire in the Wheeler Building in Boston. Mr. L. F. Rice described the construction of this building, which he had examined before the fire.

The Institute of Mining Engineers.

The fifty-fifth meeting of the Institute was opened at Ottawa, Ont., the evening of Oct. 1. About fifty members, with their wives and daughters and friends, were present The opening reception was held in the House of Commons. Sir John Macdonald, the Premier, delivered an address of welcome. The Hon. David Ross, Minister of Public Works for the Province of Quebec, also spoke. Secretary Raymond replied for the Institute. We have already published the programme of the meeting.

New England Railroad Club.

The next monthly meeting of the club will be held at the United States Hotel, Boston, Wednesday, Oct. 9, 1889. Subject for discussion: Permanent Way and Rolling Stock and their Relation to Each Other. The New England Roadmasters' Association has been invited to participate.

New York Railroad Club.

The annual meeting of the New York Railroad Club will be held at its rooms, 113 Liberty street, New York, at 7:30 p. m., Oct. 21, 1889. The subjects for discussion are: Axles, Journal Bearings, Journal Boxes and Lubrication. Officers for the ensuing year will be elected at the meeting, and all interested are urgently invited to be present.

Northwest Railroad Club.

The next meeting of the club will take place to-morrow (Saturday, Oct. 5) at 2 p. m., in the Union Depot at St. Paul. The subject for discussion is "Wheels," introduced by T. A. Fraser, of the "Soo" line.

The Brotherhood of Railroad Conductors.

The Brotherhood of Railroad Conductors concluded its first annual meeting at Los Angeles, Cal., Sept. 20. The following officers were elected: Grand Chief, George W. Howard, of Evansville, Ind.; Assistant Grand Chief, C. T. Moore, of Los Angeles; Grand Secretary and Treasurer, D. J. Con, of Los Angeles. The headquarters will remain in Los Angeles for the ensuing year. The next annual meeting will be held in Toledo, O., Sept. 18, 1890.

PERSONAL.

—Mr. Geo. W. Beale has resigned the position of Superintendent of the Portland Locomotive Works, which he has filed for 20 years.

—Mr. C. R. Thorne, for several years agent of the Lehigh Valley at Ithaca, N. Y., has been promoted to the agency of the same road at Suspension Bridge, N. Y.

—Mr. Walter H. Vaun has been appointed General Agent of the Merchants Dispatch Fast Freight Line, at Louisville, Ky., vice Capt. G. Eugene Bly, recently deceased.

—President Bennett H. Young, of the Louisville Southern, and nine others of that company last week bought the *Evening Post* at Louisville, Ky., paying for it $60,000 cash.

—Mr. R. G. Ford, until recently General Manager of the Bells Gap and the Clearfield & Jefferson railroads has been appointed General Manager of the Colorado Coal & Iron Co.

—Mr. Grant Wilkins, who has been Chief Engineer of the Atlantic Bridge & Axle Co. since its organization, has resigned. Mr. Wilkins has also been Secretary of the company.

—Mr. John S. Hammond, who has been connected with the New York, Lake Erie & Western for 35 years, first as telegraph operator and lately for many years General Freight Agent, has recently resigned.

—Mr. A. M. Waitt, for some time Assistant Manager of the Pullman Car Works, at Pullman, has resigned to become Assistant General Master Car Builder of the Lake Shore & Michigan Southern at Cleveland.

—Mr. Henry Taylor, who for the last five years has been Superintendent of the Southwest Pennsylvania road, has resigned, and will enter the service of the Frick Coke Co. as Superintendent of its Leisenring Coke Works. Mr. David Steel succeeds him as Superintendent of the Southwest Pennsylvania.

— Mr. E. T. Jeffery sailed for Europe Oct. 2, expecting to spend about three months abroad. At Chicago some of his friends assembled to see him off, including about 300 of the men from the shops. Many complimentary things were said in speeches by Mr. St. John, of the Rock Island, and by Mr. Thulman, speaking for the men.

—Mr Patrick Calhoun, General Counsel of the Richmond & West Point Terminal Co., and Col. J. H. Williamson, President of the Chattanooga, Rome & Columbus, who recently fought a duel in Alabama, have been served with extradition papers by Governor Gordon of Georgia, at the request of Governor Seay of Alabama. The duel was the outcome of statements made in the course of a discussion about railroad matters before the Georgia Legislature.

—Captain W. R. Jones, General Manager of the Edgar Thomson Steel Works, at Braddock, Pa., died at 10:30 p. m., Sept. 28, from the effects of the injuries received in the bursting of a furnace stack at those works the preceding Thursday. He was 55 years of age, and had a world-wide reputation as a steel maker. He had contributed much to the discussion of subjects connected with his profession and was ranked as one of the most skillful of its members.

—Mr. George Revett died suddenly of pneumonia at Villa Grove, Colo., Sept. 27. He had a varied experience in railroad service, serving successively as Locomotive Inspector of the New York, Lake Erie & Western, Assistant to the President of the Chicago, Rock Island & Pacific, Superintendent of Supplies for construction of the Denver & Rio Grande Western, and General Superintendent of the South Pacific Coast road. He has not been in railroad service for some time.

—Mr. Daniel Robinson, President of the Troy & Boston road, died after a long illness at Bennington Centre, Vt., Sept. 26. He was well known as a railroad man for many years, being identified with the Troy & Boston from its beginning. He was Vice-President of the line until 10 years ago, when he became President, holding that position up to the time of the absorption of the road by the Fitchburg in 1887. He was then made a director. He was largely instrumental in the construction of Hoosac tunnel.

—Mr. William D. Ewing, General Manager of the Evansville & Terre Haute and operated lines, has resigned to assume charge of a new bank in Indianapolis. When he was 22 years old Mr. Ewing became a freight brakeman on the Illinois Central. In 1869 he was appointed station agent on the Ohio & Mississippi, and he served successively as telegraph operator, private secretary to the General Superintendent and fuel agent on that road. He was appointed Agent of the Evansville & Terre Haute at Vincennes in 1874. He has since been Agent at Terre Haute, Secretary and Treasurer, General Superintendent, and since 1886 General Manager.

ELECTIONS AND APPOINTMENTS.

Atlanta & Florida.—J. S. Armstrong has been appointed Auditor of this road, with office in Atlanta, Ga.

Atlantic & Danville.—A. D. Bateman has been appointed Assistant to the General Manager, with headquarters at Portsmouth, Va. In addition to his other duties, he will also act as Purchasing Agent. V. H. Stevens has been appointed Superintendent, vice A. D. Bateman promoted, with headquarters at Portsmouth.

Augusta & West Florida.—The following officers have been elected: President, C. E. Smith, of Washington, Ga.; Vice-President, A. P. Wright, Thomasville; Secretary and Treasurer, C. Rhino, of Augusta.

Boston & Albany.—The offices of M. E. Barber, Auditor, Albert Holt, Paymaster, and Nathan Foster, General Freight Accountant, have been removed from Springfield, Mass., to Boston.

Camden, Rockport & Rockland.—New officers have been chosen as follows: President, W. T. Cobb, Rockland; Secretary and Treasurer, H. N. Pierce; Directors, A. F. Crockett, W. S. White, S. M. Bird, W. W. Case, E. R. Spear, C. H. Berry, W. T. Cobb, Rockland, Me.; F. E. Richards, H. B. Cleaves, Portland.

Concord & Montreal.—The directors of this company have elected the following officers: President, Frederick Smyth; Clerk, W. M. Chase; Treasurer, J. Frank Webster; Executive Committee, Benjamin A. Kimball, John P. Pearson, Charles A. Busiel.

Dexter & Ontario.—James S. Newton, W. W. Conde, B. C. Wilmott, J. M. Dorsey, J. R. Miller, T. T. Waller, F. A. Hinds, Frank L. Baker, H. E. Baker, Watertown, N. Y.; J. A. Outterson, Fred. E. Wood, Dexter, N. Y.; C. E. Outterson, Brownville, N. Y., and E. A. Bond, Clayton, N. Y., are the directors of this company just chartered in New York.

Eastern Minnesota.—Sidney Williams has been appointed Assistant Superintendent at West Superior, Minn. Mr. Williams was formerly secretary to President Minot.

Evansville & Terre Haute.—W. D. Ewing having resigned as General Manager of this line and of the Peoria, Decatur & Evansville and Evansville & Indianapolis, the duties pertaining to that office will hereafter be performed by the President.

Fountain Head.—The stockholders of this Kentucky company have elected the following board of directors: R. C. Jackson, S. H. George, F. A. R. Scott, J. H. Cruze, J. C. Karnes, J. A. Anderson, W. L. Welcker, C. H. Brown and J. C. White. F. A. Scott was elected President; J. C. White, Vice-President and General Manager, and Charles H. Brown, Secretary and Treasurer.

Greenville & Southeastern.—The following officers and directors have been elected: Maj. D. G. Dunklin, President; Col. A. Steinhart, Secretary; J. T. Steiner, Treasurer. Directors, D. G. Dunklin, A. G. Winkler, A. Steinhart, W. F. McKenzie, J. T. Steiner, of Greenville, Ala., and B. M. Stevens and P. N. Hickman, of Elba, Ala.

Hereford.—At the last annual meeting of the shareholders of this road, W. B. Ives, M. P., of Sherbrooke, P. Q., was elected President. Mr. Ives also retains the position of Treasurer, with C. A. Bailey as Secretary, with office in Cookshire.

Kentucky & Indiana Bridge & Railroad Co.—Flynn C. Davis has been appointed Assistant Superintendent at Louisville, Ky.

Lake Shore & Michigan Southern.—Arthur M. Waitt has been appointed Assistant General Master Car Builder of this company's lines, with office at Cleveland, O.

Lake Superior & Northern Minnesota.—At the recent annual meeting of the Grand Marais & Vermilion Co., in Duluth, Minn., the name was changed to the Lake Superior & Northern Minnesota, and the following directors were elected: Thomas W. Mayhew, Hazael Mayhew, Grand Marais; Frank Hibbing, John McKinley, Thomas Dowse and W. W. Spalding, Duluth; Geo. T. Stedman, Cincinnati; George H. Ellers, New York, and E. C. Crane, Chicago. The directors elected W. W. Spalding, President; Col. George H. Ellers, First Vice-President General Manager and Chief Engineer; T. W. Mayhew, Second Vice-President; H. Mayhew, Treasurer; Thomas Dowse, Secretary.

Long Island.—W. E. Lewis has been appointed Assistant Superintendent, with charge of Station Agents and the Telegraph Department, as heretofore, in addition to his other duties.

Louisville, St. Louis & Texas.—The annual meeting of the stockholders was held this week in Louisville. The old board of directors were re-elected, with the exception of J. H. Sample, whose place was filled by Ridgely Cayce, of Louisville. The new board consists of W. V. McCracken and George A. Evans, of New York; J. K. McCracken, James P. Helm, Ridgely Cayce, of Louisville; R. R. Pierce, of Cloverport, and J. D. Powers, of Owensboro. The board elected the old officers.

McKeesport & Bellevernon.—C. A. Rogers has been appointed General Superintendent in place of James Ritchie, assigned to other duties.

Midland (Indiana).—H. Moore, late Receiver, has been appointed Traffic Manager, and C. R. Barnhart has been appointed Superintendent.

Owensboro, Falls of Rough & Green Rirer.—R. S. Triplett, of Owensboro, Ky., has been made General Manager.

Pennsylvania.—W. Heyward Myers, formerly Superintendent of the Bedford Division, has taken the place of Superintendent Ellmaker, of the Belvidere Division, who recently went to the Sunbury Division. Mr. Myer's old position is taken by A. P. Gest

Pennsylvania, Poughkeepsie & Boston.—The stockholders have chosen the following directors: W. W. Gibbs, J. Newbold, Philadelphia; John I. Blair, Blairstown, N. J.; J. C. Stanton, New York; James W. Husted, Peekskill, N. Y.; George W. Murray, George W. Greene, Goshen, N. Y. The following executive officers were chosen: James W. Husted, President; D J. McNeese, Secretary and Treasurer; J. C. Stanton, General Manager; C. H. Stanton, General Superintendent; S. G. Primrose, Chief Engineer.

Port Jervis, Monticello & New York.—At the recent annual meeting the stockholders elected the following board of directors: Wm. B. Royce, O. P. Howell, W. H. Nearpass, W. Buckley, A. J. Hardenbergh, Chas. St. John, F. Marvin, C. E. Cuddeback. S. Van Etten, P. E. Farnum, C. V. R. Ludington, Wm. Norris and C. G. Bennett. The board organized by the election of the following officers for the ensuing year: P. E. Farnum, President; Wade Buckley, Vice-President; O. P. Howell, Treasurer; W. H. Nearpass, Secretary.

Poughkeepsie & Southeastern.—Edward L Dwyer is President of this New York company; George S. Bowen is General Manager and H. F. Keith is Chief Engineer. The headquarters are at Poughkeepsie, N. Y.

Saginaw, Tuscola & Huron.—M. V. Meredith, formerly Division Superintendent of the Flint & Pere Marquette, has been appointed Superintendent of the Saginaw, Tuscola & Huron, vice Robert Laughlin, resigned.

Sioux City & Northern.—F. C. Hills has been appointed General Superintendent and James V. Mahoney appointed General Traffic Manager, the appointments taking effect Nov. 1.

Stevenson, Sand Mountain & Dalton.—The name and residences of the incorporators of this Alabama company are Russell Farnham, Branford, Conn.; George Little, Oxford, Miss.; Thomas Lumpkin, Trenton, Ga.; M. T. Singleton, Birmingham, Ala.; G. J. Hull, C. A. Hull, S. C. Norwood, W. H. Clanton, J. H. Norwood and M. A. Clay, Jackson County, Alabama.

Talladega & Coosa Valley.—W. R. Golden has been appointed General Freight and Passenger Agent of the road, A. H. Merrill having resigned that position in order to give his entire attention to the auditing department.

OLD AND NEW ROADS.

Abbotsford & Northeastern.—Grading has been completed on this road between Abbotsford and Black Creek Falls, Wis., 15 miles. P. S Loy & Co., of De Pere, Wis., were the contractors.

Baie des Chaleurs.—This road has been opened for traffic from Metapedia, Que., to Irishtown, a distance of 57 miles. There is $40,000 due the laborers at work on the unfinished portion of the road and 500 of them have gone on strike. The government is investigating their claim and if it turns out as represented will pay them and deduct the amount from the subsidy still due. This company was voted a subsidy of $620,000 by the Dominion government to be paid upon the completion of the whole line, 120 miles in length. The latest government returns show that the company has already received $300,300, leaving a balance of $319,000 still due.

Bowling Green Northern.—The contract for building the road from Bowling Green, Ky., to a point on the Ohio River at or near Owensboro, Ky., 110 miles, has been awarded to C. H. Dishman & Co., of Owensboro, Ky.

Briarfield, Blocton & Birmingham —The company has placed on record in Jefferson County, Ala., a mortgage for $15,000,000 to the Central Trust Co., of New York. The mortgage is due in 48 years and bears five per cent. interest.

Canadian Pacific.—The extension of this company's Detroit line is now ballasted as far west as the crossing of the Grand Trunk, five miles west of Chatham, Ont Eastward the track is laid as far as Louisville. It is expected that the line will be opened by Dec. 1. Seventy-two lb. rails are being used with 9-ft. ties and 42-in. angle bars. The culverts are masonry. Large, handsome stations will be built at London, Windsor and Chatham, Ont., for which contracts have been given out to private contractors The other stations on the line will be built by the company's forces.

The company is relaying the 56 and 60-lb. rails on its main line east of Toronto with 72-lb. rails.

Egan Bros., who have the contract for constructing the Souris branch of the Canadian Pacific, have 20 miles of the road graded, and within a month's time the entire work to Souris, Man., will be completed. This firm has the contract to construct the entire branch to within a few miles of Melita.

Cape Breton.—Work is being pushed rapidly ahead on this line, and the road, 98 miles long, will be opened for traffic by July 1, 1890. The cost of the road will be about $24,000 per mile, which, with the bridge, contracted for at $500,000, will make a total of $2,900,000.

Castine & Bangor.—This company some time ago made an arrangement with a construction company to build the road if $50,000 was secured in subscriptions along the route between Bangor and Castine, Me. There now remains $26,000 to be raised, and it is expected that this amount will be made up by the towns of Penobscot and Orland in a short time.

Charleston, Cincinnati & Chicago.—McDonald, Shea & Co. now have the entire division between Johnson City, Tenn., and Minneapolis, Va., where the line will cross the Clinch Valley division of the Norfolk & Western, covered with contractors; so far they have let the following contracts: For grading in Tennessee: John Hasson & Co., 4 miles; A. Sullivan, 9 miles; W. McD. Burgin, 3 miles; Peter Peterson, 2 miles; Crigger & Evans, 2 miles; W. G. Howells & Co., 2 miles; F. C. Englesing & Co., 2 miles; G. W. Callahan & Bro., 4 miles; J. C. Sullivan, 2 miles; Dunarent & Miller, 2 miles; S. D. Dunarent, 2 miles; Foster & Goodman, 2 miles, and J. P. Griffiths, 1 mile. For grading in Virginia, contracts have been let to Cogan & Lairs for five miles and to W. Kenefick, of 101 West Ninth street, Kansas City, Mo., for 40 miles. The latter will sublet his work. W. G. Scott & Co. have been awarded the contract for all tracklaying, cross-ties and 50 miles of trestling. Gates & Bye have been awarded 20 miles of trestling, and J. G. Choffing 14 miles of trestling. The masonry is divided amongst a large number of small contractors.

The contractors expect to have 100 miles of the division completed by Dec. 1. McDonald, Shea & Co. have opened an office at Johnson City, Tenn.

Chicago, Rock Island & Pacific.—This company's line has been extended from Enid, Ind. Ter., to Hennessey, Ind. Ter., and was opened for business Oct. 1. The following are distances from Pond Creek: To Wild Horse, 11 miles; to Enid, 19 miles; to Waukomis, 30 miles, and to Hennessey, 42 miles. Reguar agencies will be established at Enid and Hennessey.

Chicago, St. Paul, Minneapolis & Omaha.—The contract for building the cut-off between Woodville and Hersey, Wis., has been let to Shephard Symes & Co., of St. Paul. This cut-off will straighten the track and shorten the main line three-fourths of a mile.

Cincinnati, Alabama & Atlantic.—The articles of consolidation of the Cincinnati, Alabama & Atlantic with the Cincinnati, Huntsville & Birmingham and the Cincinnati & Birmingham under the above name were formally registered at Nashville, Tenn., Sept. 24.

Clarksburg, Weston & Midland.—Thomas J. Steers & Co. have been awarded the contract for building the extension from Burnsville Station to Sutton, W. Va.

Colorado Central.—A suit begun at Boulder, Col., by the District Attorney, in the state District Court, to compel the Union Pacific, Jay Gould and F. L. Ames to re-open this road between Fort Collins, Col., and Cheyenne, Wy., has been transferred to the United States District Court, and the case will be heard in November. Damages of $500,000 are also asked, to recompense for losses alleged to have resulted from the closing of this road between these points seven years ago.

Columbia & Cascade.—A company has been formed to construct a line from the international boundary line, at Kettle River, Wash. Ter., to Marcus, there to connect with the Spokane Falls & Northern, whose charter enables it to build to that point. The Canadian Pacific has consented, it is said, to build a branch to the boundary line to connect with the new road.

Columbus, Lima & Milwaukee.—Richards & Co., of Defiance, O., have a large force on the section of this road between Lima and Defiance, O., and tracklaying will begin in about 30 days. It is expected to have the 43 miles completed by Dec. 15. R chards & Co. will soon let additional subcontracts. The firm has the contract for grading, furnishing ties, pile and trestle bridging, tracklaying and surfacing on the division.

Cooperstown & Charlotte Valley.—The section from West Davenport to Cooperstown, N. Y., was opened with an excursion a few days ago. The section completed is five miles in length. The road will be 24 miles long, and run from Cooperstown to Davenport Centre, where it will connect with the Delaware & Hudson Canal Co.'s line. A survey will probably soon be made for a proposed extension to Catskill, N. Y.

Dexter & Ontario.—This company, mentioned last week, has filed articles of association in the office of the Secretary of State at Albany for the purpose of constructing a railroad from the village of Brownville, in Jefferson County, N. Y., to the village of Dexter in the same county. The capital stock is $20,000.

Duluth, Crookston & Northern.—Tracklaying is to begin this week on this line, which is being built from Fertile Station to Crookston, Minn., 23 miles. Winston Bros., of St. Paul, are the contractors. The city of Crookston has subscribed about $50,000 to the capital stock of the company. R. J. Montague, of Crookston, is President, and E. W. Lewis, of Fertile, is Chief Engineer.

Ellensburg & Northeastern.—John Clifton, of Ellensburg, W. T., is the contractor on the first 10 miles of this road between Ellensburg and the Columbia River, which, as stated last week, is now nearly completed. J. C. Lloyd, of Ellensburg, is Secretary.

Evansville & Richmond.—The first through train from Elnora to Seymour, Ind., 65 miles, went over the road Sept. 25. The line will be opened between these points for general traffic in about two weeks.

Fort Madison & Northwestern.—The court at Keokuk, Iowa, has issued a decree ordering the sale of this road under foreclosure. The case has been before the courts since Oct. 18, 1884.

Georgia Southern & Florida.—It is expected to extend train service from Valdosta, Ga., to Lake City, Fla., 60 miles by Oct. 15, when it is expected to have the road ballasted and ready for traffic. At Lake City connection will be made with the Florida Central & Peninsular for points in Florida.

Georges Valley.—The survey for the road was commenced Sept. 29, and will be completed in about three weeks. The road is projected to extend from Augusta to Warren, Me., about 40 miles. Henry A. Hancox, of Hudson, Mass., is Chief Engineer.

Great Northwest Central.—A. Charlebois has been awarded the contract for constructing this line, and work is to be pushed forward as fast as possible. The line will be pushed thrcugh to Battleford next year, and it is stated that there will be no cessation of work until the Pacific Coast is reached via Bute Inlet. The road will follow the line which was surveyed by the Mackenzie government for the Canadian Pacific route, and traverses a splendid agricultural country. Messrs. Stevens & Gregson, representing the English capitalists, have paid in the first instalment of $972,000 to the company, taking the bonds and land grant of 2,800,000 acres as security for advances to be made until the road is completed.

A special general meeting of the shareholders of this company will be held at Ottawa, Oct. 21, for the purpose of passing resolutions authorizing the issue of bonds.

A. Charlebois, of Quebec, general contractor for the construction of the whole line, has awarded Macdonald & Schiller, of Toronto, Ont., a subcontract for completing the grading and tracklaying on the first 50 miles.

Greenville & Southeastern.—The survey of this Alabama road has just been completed between Greenville and Elba, 50 miles, through a fine agricultural district. A report is in circulation that the Louisville & Nashville will build the road. The company last week effected a permanent organization by electing officers.

Indianapolis, Decatur & Western.—The first mortgage bondholders of the road have formed a committee to protect their interests and to buy in the road if necessary. The road does not earn its fixed charges and a receivership is threatened, while minor creditors are pressing their claims.

International & Great Northern.—The company has filed in the District Court, at Austin, Tex., a suit against the Houston & Texas Central road to recover $170,000 alleged to be due as its portion for operating the Galveston, Houston & Harrisburg road from Houston to Galveston.

Kansas City & Suburban Belt.—Smith & Bradbury, of Kansas City, Mo., have been awarded the contract for the grading, bridging and tracklaying from Second street and Broadway, Kansas City, Mo., to Ceeil Station, a distance of four and one-half miles.

Knoxville, Cumberland Gap & Louisville.—The company has made a formal demand upon the Knoxville city authorities for bonds to the amount of $225,000 voted to the company by the city. It is reported that the mayor of Knoxville will refuse to sign the bonds on the ground that the company has not complied with the terms of the contract, and that a lawsuit will follow.

Lake Erie, Essex & Detroit River.—A special meeting of the shareholders of this company will be held at Windsor, Ont., Oct. 29, to consider the issue of mortgage bonds of the company for $760,000, for the purpose of raising money to complete the road, and to authorize the company to secure the bonds by a deed of mortgage.

Lake Shore & Michigan Southern.—The company is making considerable progress in double tracking. It is now ballasting 19 miles between Vermillion and Sandusky, O. Ten miles between Oak Harbor and Martin is also about completed. Besides this nine miles of second track has been laid on the air-line division, making a total of over 36 miles for the season. Several heavy grades have been cut down, the most important of which was probably that between Brownhelm and Amherst, O. The work is not finished yet. The next undertaking of the kind will probably be to cut 9 ft. or more from the heaviest grade now existing between Erie and Buffalo.

Lake Superior & Northern Minnesota.—This company, which is a reorganization of the Grand Marais & Vermillion will, it is announced, immediately put a corps of engineers in the field to make a preliminary survey from Grand Marais north to the iron fields.

Louisville, Cincinnati & Dayton.—The special election held in Madison township, Ind., Sept. 24, resulted in favor of the 2 per cent. tax appropriation ($90,000) to the road by a large majority.

Louisville, Evansville & St. Louis.—It is expected that grading will be completed by Nov. 1 on the Belleville, Centralia & Eastern, the extension of this road between Mount Vernon and Belleville, Ill., 67 miles. Tracklaying will also begin in November. About 300 men are now at work on the line.

Louisville & Nashville.—At a meeting of stockholders in Louisville, Oct. 2, the plan of the directors to issue new stock to retire bonds was approved. The directors are authorized to issue $13,000,000 new stock, the proceeds to be used to retire the $9,462,000 collateral trust 6 per cent. bonds at 110. The stock is offered to the present stockholders in proportion to their holdings. It is also proposed as part of the scheme to commence payment of dividends in cash on July 1, 1890. The new stock will increase the capital stock of the company to $48,000,000.

Louisville, New Albany & Chicago.—The new extension of the Louisville Southern from Lawrenceburg, Ky., to Lexington, Ky., has been leased to the Louisville, New Albany & Chicago for a term of 30 years.

Louisville, New Orleans & Texas.—Tracklaying on the new line between Coahoma and Rosedale, Miss., 50 miles, has been completed and the line will be opened for traffic this week. Grading has been finished for some time.

The company has commenced running through trains between Memphis and Natchez, Miss., the New Orleans, Fort Scott & Natchez having been widened to standard gauge between Harriston and Natchez.

Louisville Southern.—Citizens of Garrard County, Ky., have offered the company $100,000 to extend its line from its present terminus at Burgin, to Lancaster, Ky., nine miles.

Maskinonge & Nipissing.—It is expected that the contract for the construction of the first 30 miles of this Canadian road will be let this week. Five tenders have been received. This line was voted a subsidy of $3,200 per mile, for the first section of 15 miles, by the Dominion Parliament last session, which subsidy is to be extended as work progresses. This route is through a valuable mineral and timber section of Canada, and the road will shorten the distance from Quebec to Lake Nipissing from 560 to 430 miles.

Memphis, Arkansas & Texas.—The contract for building the first 10 miles of the road has been secured by the De Soto Construction Co., and the first five miles sublet to Vance & Franklin. Work has been begun at West Memphis, and it is expected to have it completed to the St. Francis River, in Arkansas, very soon. Maj. G. T. Dabney, of Memphis, Tenn., is Chief Engineer.

Milwaukee & Northern.—The extension of the Ontonagon & Brule Rivers road from the former southern terminus at Rockland, Mich., to the new station of Sidnaw, Mich., where it connects with the Duluth, South Shore & Atlantic, was opened for traffic Oct. 1. The line is 26 miles long and will be operated by the Milwaukee & Northern.

Mississippi Valley.—John Scott & Son have the contract for building this road from Vidalia, La., via Tallulah, to Lake Providence, a distance of 108 miles, and will soon begin work.

Missouri, Kansas & Texas.—It is stated that it has been discovered that the seven per cent. mortgage bonds which had been supposed to be only a lien on the lines north of Denison, Tex., are also a lien on two important lines for 90 miles south of Denison. One result of this is the fact that, owing to amendments to the motions to foreclose and the attending law's delay, foreclosure cannot be had this winter.

The extension of the Dallas & Waco branch will be completed to Waxahachie, Tex., this week. The recent heavy rains in that part of Texas have greatly retarded the work, and but for them the line would have been completed some time ago.

Montana Central.—Foley Bros. & Guthrie, of St. Paul, have received the contract for grading the first 50 miles of the line from Great Falls, Mont., to the Belt Mountain Mines, and several sub-contracts have been let. Grant & Co have secured the contract for grading, surfacing, tracklaying and bridge building on 46 miles of the Sand Coulee Branch, starting at a point near Great Falls, Mont.

New Orleans, Fort Jackson & Grand Isle.—About 1,800 tons of steel rails have been delivered at Algiers, La., and with these tracklaying will soon commence on that part of the road already graded. The line is to be built from Algiers, opposite New Orleans, south to Fort

Jackson, about 60 miles, with a branch from a point on this line to Barrataria Bay, about 30 miles below New Orleans. At Barrataria Bay connection will be made with a steamer for Grand Isle. The location for 40 miles will soon be finished, when contracts for building about 25 miles will be let. R. Klock, of New Orleans, and S. Leopold, of Myrtle Grove, La., are the principal contractors on the portion now being built. The general offices of the company are in the Morris Building, New Orleans.

Northern Pacific.—The contract for building the first 40 miles of the line from Missoula to Mullan, Mont., has been awarded to Woods, Larson & Co., of Minneapolis. The contract carries with it the privilege of extending the contract to cover the entire line, 115 miles. The Boulder-Elkhorn line, 22 miles, and the Sevington Pony branch, 20 miles, have been let to Greene, Keefe & Co., of Helena, Mont.

Ohio, Indiana & Western.—This company is hereafter to be operated by the Cleveland, Cincinnati, Chicago, & St. Louis, the latter company paying a percentage of earnings, with a guaranteed minimum. The road has been unable to meet the fixed charges under the recent reorganization, and these must be reduced to come within the earning power of the road. The terms of the reorganization are left entirely to the sellers. When it is estimated just how much rental will likely be received, the road will be reorganized so as to give the different classes of securities their share of what the rental will amount to. The road adds to the Cleveland, Columbus, Cincinnati & St. Louis system 250 miles, 213 from Peoria to Indianapolis, including an 11-mile trackage from Pekin to Peoria, and 140 from Indianapolis to Springfield, O. The latter parallels the "Bee Line" Division of the new consolidated line, and its acquisition prevents ruinous competition.

Oregon Railway & Navigation Co.—A modification of the lease of the Oregon Railway & Navigation Co. to the Union Pacific has been effected. These do not touch the rental, but provide that betterments shall not be paid from operating expenses, but shall be paid by issuing bonds of the Oregon Railway & Navigation Co. This would relieve the Oregon Short Line from danger of a deficit in its guaranteed rental. As the Union Pacific will shortly acquire, under the agreement, a large block of this company's stock, the above modification will meet with no opposition.

The new line between Spokane Falls and Rockford, W. T., which has been graded some time, is now nearly completed, and will be opened for traffic probably by Oct. 15. The new road forms an important part of a new line from the Northwest to Chicago, via the Oregon Railway & Navigation Co.'s lines and the Union Pacific, much shorter than the Northern Pacific.

Owensboro, Falls of Rough & Green River.—The road will probably be opened for freight traffic this week between Owensboro and Fordsville, Ky., 28 miles. Freight has been moving between Owensboro and Whitesville for some time. The line will probably be soon extended from Fordsville to Falls of Rough, 12 miles, and possibly to Leitchfield, Ky., to connect with the Bowling Green & Northern, just placed under contract.

Phillips & Rangely.—The surveys for this road have been commenced by Ilsley & Cummings, of Portland, Me. The road is projected to extend from Phillips to Rangely, Me., 27 miles. F. E. Timberlake, of Phillips, is Secretary.

Poughkeepsie & Southeastern.—Contracts are to be let soon for grading, tracklaying, etc., on this road, which has been surveyed from Poughkeepsie to Hopewell, N. Y., about 11 miles. H. F. Keith, of Poughkeepsie, is Chief Engineer.

Pueblo & Western.—This company has been formed to build a road from Pueblo, Col., to Beulah Springs, and thence via Middle Creek to Red Creek Springs and Silver Cliff, Col. John C. Teller, of Denver, is President.

Rockaway Valley.—The company has agreed to extend its road from Pottersville to Peapack, N. J., if $80,000 is raised along the line.

Saginaw, Tuscola & Huron.—This road is to be made standard gauge its entire length from Saginaw to Bad Axe, Huron County, Mich., 66 miles. The work will probably be begun next spring.

San Francisco & North Pacific.—The Bolinas extension has now been graded to Sawmill Gulch, and this section will be opened for traffic this week. About 150 men are at work on the extension.

Santa Fe Southern.—The engineers who are surveying the proposed southern extension of this road from Santa Fe, N. M., have finished the survey to San Pedro. A report is circulated that the Denver & Rio Grande is negotiating for a lease or the purchase of the road. The Santa Fe Southern connects with the Denver & Rio Grande at Espanola., N. M., 40 miles north of Santa Fe

Stevenson, Sand Mountain & Dalton.—The declaration of incorporation of the Stevenson, Sand Mountain & Dalton has been filed in the office of the Secretary of State at Montgomery, Ala. The company proposes to build a road from the town of Stevenson, Jackson County, via Higdon, down Sand Mountain to a point near Walnut Grove, Etowah County, there to connect with the Birmingham Mineral road. Also, to construct a branch from the mine line at Higdon down Sand Mountain to the Georgia state line, to connect with a road from Dalton, Ga., by way of La Fayette, in Walker County, and Morrison, in Dade County, Ga. The capital stock is $100,000.

Sydney & Louisburg.—The Dominion government has issued instructions for the survey of the proposed road from Sydney to Louisburg, Cape Breton.

Tennessee & Coosa.—The subscription of $50,000 voted in Huntsville, Ala., last year to this company to extend its road from Guntersville to Huntsville, by Oct. 1, 1889, has become void, the company having failed to comply with the conditions. About five miles of the extension had been graded when the company stopped work.

Texas & Pacific.—It is stated that this road is to build a new line from McGhee or Trippe, Ark., connecting with the main line at Alexandria, La., passing through Monroe. Work will commence soon.

Texas Trunk.—The Attorney-General of Texas has commenced quo warranto proceedings at Dallas, seeking to forfeit the charter of the road and for the appointment of a receiver. The court appointed John H. Taylor, of Dallas, Receiver, fixing his bond at $50,000. The case is set for trial Nov. 4, 1889.

Texas Western.—In the case of the Farmers' Loan & Trust Co. against the Texas Western, the Special Commissioner has made application to the United States Circuit Court for an additional allowance of $6,000 for the purpose of liquidating all allowances to be made by the court in the final closing of this case.

Toledo, Ann Arbor & North Michigan.—The extension from Cadillac to Frankfort and Manistee, Mich., is rapidly nearing completion, and will be open by Nov. 1. The new region opened will afford some of the best hunting and fishing in Michigan.

Toledo, Columbus & Cincinnati.—Work on the extension south from Findlay, O., has been temporarily stopped in Madison township by the sheriff serving an injunction restraining further proceedings. The action was taken on complaint of one of the landowners over whose property the company proposed to build.

Toronto, Hamilton & Buffalo.—The survey for this road has been completed and plans filed. It is rumored that the New York Central & Hudson River road is behind the enterprise.

Utica & Unadilla Valley.—Tracklaying began Sept. 17 at Bridgewater. The grading is so far advanced that the track can be laid 10 miles to West Edmeston, 30 miles south of Utica, and it is expected to open the road to that point this year. Ten miles further reaches New Berlin, and when this point is reached the line will complete a connection from Utica to Sidney, N. Y., 63 miles.

Western Counties.—Grading on the extension from Digby to Annapolis, N. S., 24 miles, is nearly all completed with the exception of a few short sections, where some heavy cutting remains to be done. The bridge at Great Joggins will be 1,300 ft. in length, with a draw 80 ft. long. The bridge over the Little Joggins will be 1,100 ft. long, with an 80 ft. draw. The approaches to these bridges will be on piling, with pitch-pine superstructure. The Bear River and Moose River bridges will be constructed on solid masonry abutments, and will each have a draw of 160 ft. and four spans of 150 ft. each. The Bear River bridge will be 1,700 ft. long, with approaches, and the Moose River bridge will be 1,300 ft. long. It is expected that tracklaying will begin before the winter closes.

Wilson Terminal.—This company has been organized at Wilson, N. Y., for the purpose of constructing a road from the Rome, Watertown & Ogdensburg station to the harbor for passenger and freight traffic, a distance of 2½ miles. P. G. Close and W. N. Harris are directors.

Winona & Southwestern.—The contract for grading and bridging a 10-mile extension of this line from Bear Creek, the present terminus, to Utica, Minn., has been awarded to Galligan & Leary. The work is to be done by Nov. 15, 1889. This line is via the switchback over the tunnels, which will be constructed at a later date. Work has already begun.

TRAFFIC.

Traffic Notes.

Twenty carloads of raisins recently left Fresno, Cal., for the East in one day.

The Northern Pacific has received three shiploads of tea from Yokohoma at Tacoma since July 19.

The Napa Wine Co., of California, recently shipped to St. Louis a consignment of 10 carloads of wine.

A St. Paul dispatch announces that the Soo Line has agreed to advance its passenger rates to the East to the prices in force via Milwaukee and Grand Haven, abolishing the very low rates made a few weeks ago.

The Santa Fe system has reduced the rate on flour to all Gulf, Colorado & Santa Fe points and Texas points to 40 cents per 100 lbs. from St. Louis. The Missouri Pacific has adopted the same to Texas common points and has also put in effect a 35-cent grain rate to Texas.

The Boston & Albany has reduced passenger rates to the West to meet the cut of the Fitchburg and Boston & Maine. Chicago, first class, from Boston is $20; Cincinnati, $18.50; St. Louis, $24.25, and corresponding figures to other points in the West, Northwest and Southwest.

The Atchison, Topeka & Santa Fe has made the rate on sugar from San Francisco to Wichita, Kan., the same as that to Kansas City, a reduction of 41 cents per 100 lbs. Heretofore the through rate has been increased by the amount of the tariff from Kansas City back to Wichita.

The Pennsylvania Co. and the New York, Pennsylvania & Ohio have reduced rail and lake freight rates from Pittsburg to St. Paul and Minneapolis from 75, 62, 55, 38, 29, 26 to 72½, 62, 39½, 32, 25 and 22½; iron and steel in car load lots are reduced from 23 to 22½ cents; glassware from 42½ to 34½.

Judge Thayer in the United States District Court at Hannibal, Mo., has refused a new trial in the case against the Missouri Pacific, in which a jury decided that a rate from Hannibal to Harper, Kan., must not be greatly disproportionate to the amount charged over the same line on a shipment coming from Chicago. The case will probably be appealed.

The Michigan Passenger Association has resolved to abolish all excursion rates on the certificate plan, all round-trip single-day rates and one-way party rates, leaving no reduced fares in effect except for round trips to parties of 10 or 50. This extensive raising of rates is a result of the recent law of that state going into effect Oct. 1, which reduces the fares on many of the roads to two cents per mile.

A prominent fruit dealer of Philadelphia, in an interview in the *Fruit Trade Journal*, says that ventilated cars for the transportation of fruit from the South are increasing in favor, on account of the expense and uncertainty connected with transportation in refrigerator cars. While admitting that perfect refrigeration preserves the appearance and prevents the decay of fruit, he claims that it destroys the stamina and flavor of many kinds. It is claimed that the exclusion of light and dirt are the chief desiderata to make ventilated cars successful.

The contest in the Trans-continental Association between the Southern Pacific and Canadian Pacific has resulted in rates quoted by members of the Trans-continental Association but unauthorized by other associations. The matter had gone to such an extent that serious objection was made by members of Eastern associations, and the Central Traffic Association has now resolved: "That all rates which directly or indirectly affect the roads within the territory of the Central Traffic Association must be subject to agreement between the two associations, and that no tariffs or divisions will be accepted or honored unless agreed to previous to their issuance, and that Chairman Blanchard issue instructions that will prevent such unauthorized rates being passed."

The Inter-state Commerce Commission.

The Commission met in Kansas City, Sept. 25, and heard a complaint from Humboldt, Kan., alleging discrimination in freight charges on sugar from San Francisco, as compared with rates to Missouri River points. The statistician of the Atchison, Topeka & Santa Fe testified that the cost of hauling sugar from San Francisco to the Missouri River was 4¾ mills per ton per mile, and the charge 5.1 mills per ton per mile.

On Sept. 30 the Commission met in Chicago and heard the complaint against the Lake Shore & Michigan Southern, charging that wheat delivered by the complainant at Dayton, Mich., had been charged with deductions, for which he asked $300 compensation. It was affirmed that 5 lbs. were deducted from each load, and sometimes as much as 9 lbs. The road claimed the amount deducted was barely sufficient to idemnify the company for shrinkage; wheat was stored and receipts given for it without charge to farmers, and it was always the custom to deduct fractional parts of 5 lbs. It was claimed that the particular case occurred in 1884, before the law went into effect. The case was taken under advisement.

The complaint of the Inter-state Commerce Railway Association against the Chicago & Alton was heard. The Alton denied the right of the Association to make complaint, on the ground that it is neither a real person nor an artificial person. The Commission on the following day virtually sustained this argument, recommending that individual roads, either singly or jointly, should make such petitions, and giving leave to amend the present complaint. As to the complaint itself, Judge Cooley said that a *prima facie* case having been made out as to the American Live Stock Association, a showing of its railroad contract would be required. The hearing would be at Washington.

The case of the Chicago, Kansas & Nebraska and the Chicago, Rock Island & Pacific against the Chicago & Alton was heard. The point at issue is in regard to live stock stop-over privileges at Kansas City.

E. M. Raworth, of Fargo, Dak., has filed a complaint with the Inter-state Commerce Commission against the Northern Pacific, St. Paul, Minneapolis & Manitoba, Union Pacific, Southern Pacific and the Oregon Railway & Navigation Co., charging that the defendants wrongfully charged 97 cents per 100 lbs. on sugar C. L. from San Francisco to Fargo, and 65 cents to St. Paul, 275 miles east of Fargo.

Pacific Coast Lumber.

The *Northwestern Lumberman*, in an article on the lumber trade of the Pacific coast, states that within a few years a good deal of lumber and shingles from California, Oregon and Washington have been sold in Colorado and Wyoming, and that Puget Sound timber has been sold in considerable quantities to Kansas and New Mexico. Within the past two years cedar shingles have been taken to Ohio, Illinois and Iowa, and large sales have been made in Nebraska. Last year the Northern Pacific took several hundred carloads of lumber across the mountains, much of it reaching St. Paul.

This traffic, however, cannot be regarded as permanent, and it appears to have been the result largely of excessive production by the mill owners and special rates made by the railroads, which it is not certain can be maintained. The sharp competition between white and Southern pine in the Mississippi Valley has reduced prices, and specialties like shingles, long timber and red wood finishing lumber are the only kinds of lumber for which a market can be counted on with certainty. Many of the branches of trade that were active last year have made no show this year.

The Inter-state Commerce Railway Association.

The Chicago, Burlington & Quincy has applied to Chairman Walker for a redistribution of the freight traffic from Southwestern Missouri River points, under section 17 of the agreement. The application states that "Of the revenue from the competitive eastbound traffic from Southwestern Missouri River points the Burlington lines received in June 18.31 per cent.; July, 18.96 per cent.; August, 9.36 per cent. For the first seventeen days in September the percentage received by the Burlington lines, as shown by carloads, the revenue not having yet been computed, was 9.06 per cent.

"There is no claim that the business carried by the Burlington lines in June and July was obtained by other than legitimate methods; but in August the business suddenly fell off one-half, and in September has not improved.

"Having fulfilled our part of the agreement, we now call upon the association to carry into effect section 17."

The Chicago, Milwaukee & St. Paul has reduced freight rates between Dubuque and St. Paul from 55 cents to 40 cents (first class).

The Burlington road has reduced rates from St. Paul to St. Louis, via the St. Louis, Keokuk & Northwestern, from 63 cents to 52 cents (first class).

The Wabash has threatened to reduce rates from Chicago to Keokuk, and the Chicago, Burlington & Quincy threatens to make a similar reduction to Quincy, both reductions being made in consequence of the low rates to other Mississippi River points further north. Extended discussions have been held at Chicago, and it does not appear that these rates have yet been put into effect, but there has been no settlement.

Chairman Walker has denied the application of the Minneapolis & St. Louis for authority to join the Duluth, Red Wing & Southern in a 17½ cent tariff on grain from Zumbrota to St. Louis. The existing rate from Zumbrota to Chicago is 14 cents, and there is no through rate from Zumbrota to St. Louis, except the sum of the locals, 21 cents. The Zumbrota district, or Southeastern Minnesota, is reached by direct lines of the Chicago & Northwestern, and the Chicago, Milwaukee & St. Paul. Chairman Walker takes the ground that the proposed route is too roundabout to be given a differential rate, particularly to a partnership of roads.

East-bound Shipments.

The shipments of east-bound freight from Chicago by all the lines for the week ending Saturday, Sept. 28, amounted to 58,912 tons, against 52,820 tons during the preceding week, an increase of 6,092 tons, and against 59,298 tons during the corresponding week of 1883, an increase of 386 tons. The proportions carried by each road were:

	W'k to Sept. 28.		W'k to Sept. 21.	
	Tons.	P. c.	Tons.	P. c.
Michigan Central	5,109	8.7	5,006	9.9
Wabash	4,994	8.5	3,335	6.3
Lake Shore & Michigan South.	11,134	18.8	11,123	21.2
Pitts., Ft. Wayne & Chicago	6,523	11.1	6,055	11.5
Chicago, St. Louis & Pitts.	7,885	13.4	7,779	14.7
Baltimore & Ohio	3,644	6.2	3,725	7.0
Chicago & Grand Trunk	8,618	14.6	7,250	13.7
New York, Chic. & St. Louis	3,141	5.3	3,808	7.2
Chicago & Atlantic	7,864	13.4	4,730	9 0
Total	58,912	100.0	52,820	100.0

Of the above shipments 2,290 tons were flour, 19,424 tons grain, 2,809 tons millstuffs, 5,673 tons cured meats, 2,097 tons lard, 10,450 tons dressed beef, 1,380 tons butter, 2,154 tons hides, 209 tons wool and 6,338 tons lumber. The three Vanderbilt lines together carried 32.8 per cent., while the two Pennsylvania lines carried 24.5 per cent.